CONTENT

OPERATING SYSTEM

What is an operating system?

An operating system is the most important software that runs on a computer. It manages the computer's memory and processes, as well as all of its software and hardware. It also allows you to communicate with the computer without knowing how to speak the computer's language. Without an operating system, a computer is useless.

The operating system's job:

Your computer's **operating system** (**OS**) manages all of the **software** and **hardware** on the computer. Most of the time, there are several different computer programs running at the same time, and they all need to access your computer's **central processing unit (CPU)**, **memory**, and **storage**. The operating system coordinates all of this to make sure each program gets what it needs.

Types of operating systems:

Operating systems usually come **pre-loaded** on any computer you buy. Most people use the operating system that comes with their computer, but it's possible to upgrade or even change operating systems. The three most common operating systems for personal computers are **Microsoft Windows**, **Mac OS X**, and **Linux**.

Modern operating systems use a **graphical user interface**, or **GUI** (pronounced **gooey**). A GUI lets you use your mouse to click **icons**, **buttons**, and **menus**, and everything is clearly displayed on the screen using a combination of **graphics** and **text**.

Each operating system's GUI has a different look and feel, so if you switch to a different operating system it may seem unfamiliar at first. However, modern operating systems are designed to be **easy to use**, and most of the basic principles are the same.

Microsoft Windows:

Microsoft created the **Windows** operating system in the mid-1980s. Over the years, there have been many different versions of Windows, but the most recent ones are

- **Windows 10** (released in 2015),
- **Windows 8** (2012),
- **Windows 7** (2009), and
- **Windows Vista** (2007).

Windows comes **pre-loaded** on most new PCs, which helps to make it the**most popular operating system** in the world.

Mac OS X:

Mac OS is a line of operating systems created by Apple. It comes preloaded on all new Macintosh computers, or Macs. All of the recent versions are known as **OS X**(pronounced O-S Ten), and the specific versions include

- **El Capitan** (released in 2015),
- **Yosemite** (2014),
- **Mavericks** (2013),
- **Mountain Lion** (2012), and
- **Lion** (2011).

According to **Stat Counter Global Stats**, Mac OS X users account for less than **10%** of global operating systems—much lower than the percentage of Windows users (more than **80%**). One reason for this is that Apple computers tend to be more expensive. However, many people do prefer the look and feel of Mac OS X over Windows.

Linux: Linux (pronounced **LINN-ux**) is a family of **open-source** operating systems, which means they can be modified and distributed by anyone around the world. This is different from **proprietary software** like Windows, which can only be modified by the company that owns it. The advantages of Linux are that it is **free**, and there are many different **distributions** or versions are available.

Operating systems for mobile devices:

The operating systems we've been talking about so far were designed to run on **desktop** and **laptop** computers. **Mobile devices** such as **phones**, **tablet computers**, and **MP3 players** are different from desktop and laptop computers, so they run operating systems that are designed specifically for mobile devices. Examples of mobile operating systems include **Apple iOS** and **Google Android**.

Operating systems for mobile devices generally aren't as fully featured as those made for desktop and laptop computers, and they aren't able to run all of the same software. However, you can still do a lot of things with them, like watch movies, browse the Web, manage your calendar, and play games.

Code name	Version number	Initial release date
(No codename)	1.0	September 23, 2008
(Internally known as "Petit Four")	1.1	February 9, 2009
Cupcake	1.5	April 27, 2009
Donut	1.6	September 15, 2009
Eclair	2.0 – 2.1	October 26, 2009
Froyo	2.2 – 2.2.3	May 20, 2010
Gingerbread	2.3 – 2.3.7	December 6, 2010
Honeycomb	3.0 – 3.2.6	February 22, 2011
Ice Cream Sandwich	4.0 – 4.0.4	October 18, 2011
Jelly Bean	4.1 – 4.3.1	July 9, 2012

KitKat	4.4 – 4.4.4	October 31, 2013
Lollipop	5.0 – 5.1.1	November 12, 2014
Marshmallow	6.0 – 6.0.1	October 5, 2015
Nougat	7.0 – 7.1.2	August 22, 2016
Oreo	8.0 – 8.1	August 21, 2017

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Class:III B.Sc(IT)

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Developer:	Apple inc
Written in:	c,c++,objective-c,swift.
Os family:	unix-like,based on Darwin,mac os
Initial release:	june 29,2007;
Marketing target:	smart phones,tablet.
Available in:	40 languages.
Update method:	iTunes or OTA.
Kernel type:	Hybrid(XNU)
Default user interface:	cocoa touch
Official website:	www.apple.com

This article is about apple's mobile operating system. **ios** is a mobile operating system created and developed by **Apple inc**. this os including **iphone, ipad, ipod touch.**

- ➢ It is the **second** most popular mobile operating system globally after **Andraid**.
- ➢ Originally unviled in 2007 for the **iphone**, ios has been extended to support other Apple devices such as the **ipod touch** and the **ipad**. As of January 2017, Apple's **App store** contains more than 2.2 million ios applications, 1 million of which are hative for ipads. These **mobile apps** have collectively been downloaded more than 130 billion times.
- ➢ The ios **user interface** is based upon direct manipulation, using **multi-touch** gestures. Interface control elements consist of sliders, switches, and buttons. Interaction with the os includes gestures such as swipe, tap, pinch, and reverse pinch, all of which have specific definition within the context of the ios operating system and its multi-touch interface.
- ➢ Major versions of ios are released annually. The current version **ios11**, was released on September 19,2017. It is available for all ios devices with **64-bit processors;** the **iphone 5s** and later iphone models. The **ipad(2017)**. The **ipad Air** and later ipad air models, all **ipad pro** models, the **ipad mini2** and later ipad mini models, and the **sixth-generation ipad touch.**

<ins>HISTORY</ins>:

- ➢ In 2005, when **steve jobs** began planning the **iphone**, he had a choice to either "shrink the mac. which would be an epic feat of engineering, or enlarge the ipod".

Jobs favored the former approach but pitted the **macintosh** and **tony fodell**. Respectively, against each other in an internal competition, with forstall winning by creating the iphoneos.

➢ The decision enabled the success of the iphone as a platform for third-party developers: using a well-known desktop operating system as its basis allowed the many third-party mac developers to write software for the iphone with minimal retraining.

FEATURES:

1. Background audio application continues to run in the background as long as it is playing audio or video content.
2. Voice over ip-application is suspended when a phone call is not in progress.
3. Background location-application is notified of location changes.
4. **Push notifications**
5. Local notifications- application schedules local notifications to be delivered at a predetermined time.
6. Task completion-application asks the system for extra time to complete a given task.
7. Fast app switching – application does not execute any code and may be removed from memory at any time.

HARDWARE:

- The main hardware platform for ios is the **ARM architecture**. ios releases before **ios6** can only be run on ios devices with **32-bit** ARM processor.

✓ **ios1**:
1. **Touch screen**: Apple includes a screen that responds to finger press and swipes.
2. **Pinch-to- zoom**: user can pinch the screen to zoom the view in or out.
3. **Apple safari web browser**: A mobile version of apple web browser.
4. **iTunescompatibility**: USB connection to iTunes –enabled computer.
5. **Hidden files system**: unlike with a computer, the user cannot directly access the files present on the device.

✓ **ios2**:
1. **Contact search**: can search contact by name
2. **Microsoft exchange support:** push email and other futures have support.
3. **iTunes genius support**: playlists create by iTunes based on past music.

- ✓ **ios3**:
    1. **copy/paste capability** :text selectable to copy and paste.
    2. **Spotlight search**: can search a web page with keywords.
    3. **USB or Bluetooth tethering**: other mobile devices can access internet through iphone.
    4. **Remote lock**: device can be shutoff using mobile.
- ✓ **ios4**:
    1. **Multitasking**: iphone cannot run background apps,but can receive certain notification from apps.
    2. **Game center**: an organization app used to plays all games in one place.
    3. **Tv shows rentals**: iphone can now display tv shows.
    4. **Version availability**: iphone now available to version uses .
- ✓ **ios5**:
    1. **Notification center**: a drop down notification center for organizing app actions.
    2. **iTuneswi-fi sync** : iphone can share data back and forth with iTunes.
    3. **icloud**: A network user can setup to connect the all their apple devices.
    4. **imessage**: Apple's texting app.

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Operating System types

I. GUI operating systems are:

- ❖ System 7.x
- ❖ Windows 98
- ❖ Windows CE

II. Multi-user:

- ❖ Linux
- ❖ Unix
- ❖ Windows 2000

III. **Multiprocessing:**

- ❖ Linux
- ❖ Unix
- ❖ Windows XP

IV. **Multitasking:**

- ❖ Linux
- ❖ Unix
- ❖ Windows 8

V. **Multithreading:**

- ❖ Linux
- ❖ Unix
- ❖ Windows XP

Operating System listing:

Operating system	**Date first released**	**Platform**	**Developer**
AIX and AIXL	Unix and Linux history.	Various	IBM
AmigaOS	Currently no AmigaOS history.	Amiga	Commodore
Android	November 5, 2007	Mobile	Google
BSD	Unix and Linux history.	Various	BSD
Caldera Linux	Unix and Linux history.	Various	SCO
Chrome OS	July 7, 2009	Various	Google
Corel Linux	Unix and Linux history.	Various	Corel
CP/M	Currently no CP/M history.	IBM	CP/M
Debian Linux	Unix and Linux history.	Various	GNU
DUnix	Unix and Linux history.	Various	Digital
DYNIX/ptx	Unix and Linux history.	Various	IBM
HP-UX	Unix and Linux history.	Various	Hewlett Packard
iOS	2010	Mobile	Apple
IRIX	Unix and Linux history.	Various	SGI

Kondara Linux	Unix and Linux history.	Various	Kondara
Linux	Unix and Linux history.	Various	Linus Torvalds
Mac OS 8	Apple operating system history.	Apple Macintosh	Apple
Mac OS 9	Apple operating system history.	Apple Macintosh	Apple
Mac OS 10	Apple operating system history.	Apple Macintosh	Apple
macOS X	Apple operating system history.	Apple Macintosh	Apple
Mandriva Linux	Unix and Linux history.	Various	Mandriva
MINIX	Unix and Linux history.	Various	MINIX
MS-DOS 1.x	MS-DOS history.	IBM	Microsoft
MS-DOS 2.x	MS-DOS history.	IBM	Microsoft
MS-DOS 3.x	MS-DOS history.	IBM	Microsoft
MS-DOS 4.x	MS-DOS history.	IBM	Microsoft
MS-DOS 5.x	MS-DOS history.	IBM	Microsoft
MS-DOS 6.x	MS-DOS history.	IBM	Microsoft
NEXTSTEP	Apple operating system history.	Various	Apple
OS/2	1987	IBM	IBM
OSF/1	Unix and Linux history.	Various	OSF
QNX	Unix and Linux history.	Various	QNX
Red Hat Linux	Unix and Linux history.	Various	Red Hat
SCO	Unix and Linux history.	Various	SCO
Slackware Linux	Unix and Linux history.	Various	Slackware
Sun Solaris	Unix and Linux history.	Various	Sun
SuSE Linux	Unix and Linux history.	Various	SuSE
Symbian	1997	Mobile	Nokia
System 1	Apple operating system history.	Apple Macintosh	Apple
System 2	Apple operating system history.	Apple Macintosh	Apple

System 3	Apple operating system history.	Apple Macintosh	Apple
System 4	Apple operating system history.	Apple Macintosh	Apple
System 6	Apple operating system history.	Apple Macintosh	Apple
System 7	Apple operating system history.	Apple Macintosh	Apple
System V	Unix and Linux history.	Various	System V
Tru64 Unix	Unix and Linux history.	Various	Digital
Turbolinux	Unix and Linux history.	Various	Turbolinux
Ultrix	Unix and Linux history.	Various	Ultrix
Unisys	Unix and Linux history.	Various	Unisys
Unix	Unix and Linux history.	Various	Bell labs
UnixWare	Unix and Linux history.	Various	UnixWare
VectorLinux	Unix and Linux history.	Various	VectorLinux
Windows 10	Microsoft Windows history.	IBM	Microsoft
Windows 2000	Microsoft Windows history.	IBM	Microsoft
Windows 2003	Microsoft Windows history.	IBM	Microsoft
Windows 3.X	Microsoft Windows history.	IBM	Microsoft
Windows 7	Microsoft Windows history.	IBM	Microsoft
Windows 8	Microsoft Windows history.	IBM	Microsoft
Windows 95	Microsoft Windows history.	IBM	Microsoft
Windows 98	Microsoft Windows history.	IBM	Microsoft
Windows CE	Microsoft Windows history.	PDA	Microsoft
Windows ME	Microsoft Windows history.	IBM	Microsoft
Windows NT	Microsoft Windows history.	IBM	Microsoft
Windows Vista	Microsoft Windows history.	IBM	Microsoft
Windows XP	Microsoft Windows history.	IBM	Microsoft
Xenix	Unix and Linux history.	Various	Microsoft

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SOLARIS OPERATING SYSTEM

INTRODUCTION:-

Solaris is a Unix operating system originally developed by Sun Microsystems. It superseded their earlier SunOS in 1993. In 2010, after theSun acquisition by Oracle, it was renamed **Oracle Solaris**.

Solaris is known for its scalability, especially onSPARC systems, and for originating many innovative features such as DTrace, ZFS and Time Slider.Solaris supports SPARC-based and x86-based workstations and servers from Oracle and other vendors, with efforts underway to port to additional platforms. Solaris is registered as compliant with the Single UNIX Specification.

Historically, Solaris was developed as proprietary software. In June 2005, Sun Microsystems released most of the codebase under the license, and founded the OpenSolaris open-source project.With OpenSolaris, Sun wanted to build a developer and user community around the software. After the acquisition of Sun Microsystems in January 2010, Oracle decided to discontinue the OpenSolaris distribution and the development model.In August 2010, Oracle discontinued providing public updates to the source code of the Solaris kernel, effectively turning Solaris 11 back into a closed sourceproprietary operating system. Following that, in 2011 the Solaris 11 kernel source code leaked toBitTorrent. However, through the Oracle Technology Network (OTN), industry partners can still gain access to the in-development Solaris source code.Source code for the open source components of Solaris 11 is available for download from Oracle.

On September 2, 2017, Simon Phipps reported that Oracle had laid off the Solaris core development staff, interpreting it as sign that Oracle no longer intends to support future development of the platform.

Group members of solaris.solarisos and World's most advanced enterprise operating system. SunOS is a Unix branded operating system. Developed by sun Microsystems. Marketed under the brand name solaris.

HISTORY OF SOLARIS:-

In 1987, AT&T Corporation and Sun announced that they were collaborating on a project to merge the most popular Unix variants on the market at that time: Distribution, UNIX, and Xenix .This become UNIX system v release (svr4)

On September 4, 1991, Sun announced that it would replace its existing BSD-derived Unix, SunOS, with one based on SVR4. This was identified internally as *SunOS 5*, but a new marketing name was introduced at the same time: *Solaris.* The justification for this new overbrand was that it encompassed not only SunOS, but also the OpenWindows graphical user interface and Open Network Computing (ONC) functionality.

Although SunOS 4.1.*x* micro releases were retroactively named *Solaris 1* by Sun, the Solaris name is used almost exclusively to refer only to the releases based on SVR4-derived SunOS 5.0 and later.

For releases based on SunOS 5, the SunOS minor version is included in the Solaris release number. **For Example**, Solaris 2.4 incorporates SunOS 5.4. After Solaris 2.6, the *2.* was dropped from the release name, so Solaris 7 incorporates SunOS 5.7, and the latest release SunOS 5.11 forms the core of Solaris 11.3.

Although SunSoft stated in its initial Solaris 2 press release their intent to eventually support both SPARC and x86 systems, the first two Solaris 2 releases, 2.0 and 2.1, were SPARC-only. An x86 version of Solaris 2.1 was released in June 1993, about 6 months after the SPARC version, as a desktop and uniprocessor workgroup server operating system. It included theWabi emulator to support Windows applications.At the time, Sun also offered the Interactive Unix system that it had acquired from Interactive Systems Corporation.In 1994, Sun released Solaris 2.4, supporting both SPARC and x86 systems from a unified source code base.

ADVANTAGES:
1.Performance : Mainly because it is optimized to work with the SPARC, it gives better performance than the other alternatives available. You would find many of the Sun's server solutions running with the Solaris OS such as Netra series.
2.POSIX compliant environment: Solaris can be considered to be compliant with the POSIX environment which means a standard programming interface for developers.

DISADVANTAGES:-
1. Uncompatible : It is not recommended to run Solaris on other architectures such as Intel, AMD. It is possible to install Solaris on Intel however, the performance would degrade considerably since Solaris cannot make use of Intel that efficiently.
2. Lack of good GUI : Solaris does have GUI support - Common Desktop Environment, OpenWindows etc. but they are far away from the other GUI environments seen in Windows or Mac.
3. Costlier : With other cheaper alternatives such as Linux available, it proves to be costlier to acquire a license of Solaris. Since it is intended to be used on SPARC so the end user often ends up in buying the hardware as well.

SYSTEM REQUIREMENTS OF SOLARIS:-

The highly versatile Solaris 10 Operating System provides a complete computing environment with minimal hardware requirements.

- Minimum of 512mb Ram,1.5gb Ram or higher is recommend.
- 32 or 64 bit system based on AMDIntel and VIA X86 Cpus
- Sun ultra SPARC based processors (sun4v architecture).

TECHNOLOGIES OF SOLARIS:-

        Solaris Technologies is a award winning global telecommunications company and a top Texas-based manufacturer of galvanized mobile towers including cell phone towers. One of our specialties is the design and manufacture of the ToughTower™ product platform, known in the wireless industry as the Cell on Wheels (COW) or "portable cell tower" solution. Solaris also offers a variety of new and certified refurbished telecom networking equipment. For repair service, we have certified technicians on site to provide quality repair services with a 10-21 day lead time.

        Additionally, we recently introduced a line of world class security products from Garrett Metal Detectors to complement the rest of our high-tech product suite. The new line includes both walk-through and hand-held metal detectors, along with full service implementation and technical support in partnership with Garrett.

        Solaris' best in class professional engineers and certified technicians have more than a century of telecommunications experience. Our passion was ignited by our award winning founder and CEO, Evelyn L. Torres. Ms. Torres spent many years providing technical products and solutions to a demanding customer base during her time at Nokia Siemens Networks.

LICENSES OF SOLARIS:-

- 1982-2004-Traditional operating system licenses.
- 2005-2010-Open source/close source.
- 2011 and later-Post oracle closed source (solaris 10 after march 2010/solaris 11).

Only solaris supplies the full range of services needed to meet the needs of

- internet
- intranet and
- enterprise computing.

VERSIONS OF SOLARIS:-

1982 Feb-SunOS 1.0 based on BSD.

1985 may-sunOS 2.0

1986 Feb-SunOS 3.0

1989 –SunOS 4.0

1990 nov- solaris 1.0(sunOS4.1.1)

1991 July–solaris 2.0(SunOS 5.0)based on system v rel.4)

1993 may-solaris 2.2(SunOS 5.2)first time with multithreading

1994 dec-solaries 2.4(SunOS 5.4)first time for x86 platform.

1998 march-solaris 2.6(SunOS 5.6)

1998 Oct-solaris 7(SunOS 5.7)

2000 Jan-solaris 8(SunOS 5.8)

2000 nov-trusted solaries 8

2002 may-solaris 9 SPARC

2003 Feb-solaris 9 x86

2003 Aug-solaris 9 8/03

2004 nov-solaris 10

2005 march-solaris 10 3/05

2006 Dec-solaris 10 11/06

2007 Sept –solaris 10 8/07

2008 April-solaries 10 5/08

2009-sparc and X86

2010-solaris 11

2015-sparc box due round

CONCLUSION:-

- Computer science students whose classes are standardized on Solaris, or who believe that they should get some Solaris experience before going into a real world that might require them to work in Sun environments. However, you should run this either on a virtual machine or a separate box; you *don't* want this as your regular productivity environment.
- People who enjoy computer experimentation. You should run this in a virtual machine or a separate box for the same reason as computer science students should.
- Solaris developers, of course. You probably should put this on a separate box rather than use a VM, because the difference between running as the native OS and as a virtual machine probably would be important to you. For your actual office productivity stuff, you probably want Linux or XP on another workstation. Even if you use Sun's VirtualBox to run Linux or XP, you're still at the mercy of the base OS to run printers, scanners, etc., and I believe this to be *far* more trouble than it's worth at this time.

- Some application you *must* have is Solaris only.Most powerful and versatileUnix operating environment.Multi threaded,multi processing-capable kernel.Large number of third –party applications.
- Microsoft windows applications support.

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MOBILE OPERATING SYSTEM(ANDROID)

A **mobile operating system** (or **mobile OS**) is an operating system for phones, tablets,smartwatches, or other mobile devices. While computers such as typical laptops are 'mobile', the operating systems usually used on them are not considered mobile ones, as they were originally designed for desktop computers that historically did not have or need specific *mobile* features. This distinction is becoming blurred in some newer operating systems that are hybrids made for both uses.

FEATURES

Mobile operating systems combine features of a personal computer operating system with other features useful for mobile or handheld use; usually including, and most of the following considered essential in modern mobile systems; a touchscreen, cellular, Bluetooth, Wi-Fi Protected Access, Wi-Fi, Global Positioning System (GPS) mobile navigation,video- and single-frame picture cameras, speech recognition, voice recorder, music player, near field communication, and infrared blaster. By the end of 2016, over 430 million smartphones were

sold with 81.7 percent running Android, 17.9 percent running iOS, 0.3 percent running Windows 10 Mobile (no longer marketed) and the other OSes cover 0.1 percent.[1] Android alone is more popular than the popular desktop operating system Windows, and in general smartphone use (even without tablets) outnumber desktop use (desktop use, web use, overall is down to 44.9% in the first quarter of 2017).

HISTORY OF ANDROID OS

Code name	Version number	Initial release date	API level	Security patches[1]
(Internally known as "Petit Four")	1.1	February 9, 2009	2	Unsupported
(No codename)	1.0	September 23, 2008	1	Unsupported
Cupcake	1.5	April 27, 2009	3	Unsupported
Donut	1.6	September 15, 2009	4	Unsupported
Eclair	2.0 – 2.1	October 26, 2009	5 – 7	Unsupported
Froyo	2.2 – 2.2.3	May 20, 2010	8	Unsupported
Gingerbread	2.3 – 2.3.7	December 6, 2010	9 – 10	Unsupported
Honeycomb	3.0 – 3.2.6	February 22, 2011	11 – 13	Unsupported
Ice Cream Sandwich	4.0 – 4.0.4	October 18, 2011	14 – 15	Unsupported

Jelly Bean	4.1 – 4.3.1	July 9, 2012	16 – 18	Unsupported
KitKat	4.4 – 4.4.4	October 31, 2013	19 – 20	Unsupported

Legend:

Old version

Older version, still supported

Latest version

Lollipop	5.0 – 5.1.1	November 12, 2014	21 – 22	Supported
Marshmallow	6.0 – 6.0.1	October 5, 2015	23	Supported
Nougat	7.0 – 7.1.2	August 22, 2016	24 – 25	Supported
Oreo	**8.0 – 8.1**	August 21, 2017	26 – 27	Supported

ANDROID 8.1 IS LIVE

Android 8.1 Oreo is available on the Android Open Source Project, and will roll out the update to Pixel and Nexus devices within the next week. While Google did not announce a rollout for other devices.

There aren't a ton of new features in Android 8.1 compared to Android 8.0, but some handy changes have been made. For example, the preview includes a test for allowing apps to make a notification sound only once per second. Autofill is also greatly improved in the update.

Perhaps the most helpful change is a battery indicator for your Bluetooth devices, which will appear next to the Bluetooth indicator in the Quick Settings. Apart from that, most of the changes are aesthetic. For example, the user interface will change based on your wallpaper. In other words, if you have a darker wallpaper, things like the quick settings menu will change to a darker gray, while they are otherwise white. That seems to only apply when the wallpaper is visible. The quick settings menu has become semi-transparent, so you will be able to faintly see what's behind it.

Next up is the Settings menu, which has been overhauled to be similar to what you'll find on the Pixel 2 and Pixel 2 XL — making them much easier to use.

Even the notifications bar has gotten a bit of an update in Android 8.1. When it's inactive, it will now dim — which may be an attempt to prevent things like screen burn-in on the Google Pixel 2

Finally, we also have a proper Android Oreo easter egg, which you can access by going to "About phone" and tapping the Android version seven times. The easter egg basically just displays an Oreo cookie, instead of the previous Android O orange icon.

The update also activates the Pixel Visual Core system-on-a-chip (SoC), which is the image processor built into the Pixel 2 and Pixel 2 XL specifically for processing photos. According to Google, that SoC will make image processing a little smoother, which could be very helpful for things like Google Lens.

HOW TO INSTALL ANDROID OREO

There are two ways to install Android Oreo: OTA (over the air, or using menus within the phone itself) or manually. OTA is the easiest — in the coming days, you'll get a notification on your Pixel, Nexus 5X/6P, Pixel C, or Nexus Player to upgrade to Android Oreo. You'll get the same notification if you are enrolled in the Android Beta Program. Just follow the prompts to install the update.

You don't have to wait to install Android Oreo, though. You can download factory images from Google's Android Developer page and install it manually, but it requires a little more technical know-how. Check out our in-depth guide to installing Android Oreo for more.

NEW FEATURES IN ANDROID OREO

New emoji, picture-in-picture mode, mutli-window, and UI tweaks

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Different Types of Operating System in the computer and mobile environment

I. Introduction of Operating System:

An **operating system** is the **most important software** that runs on a computer. It manages the computer's **memory** and **processes**, as well as all of its **software** and **hardware**. It also allows you to **communicate** with the computer without knowing how to speak the computer's language. **Without an operating system, a computer is useless**.
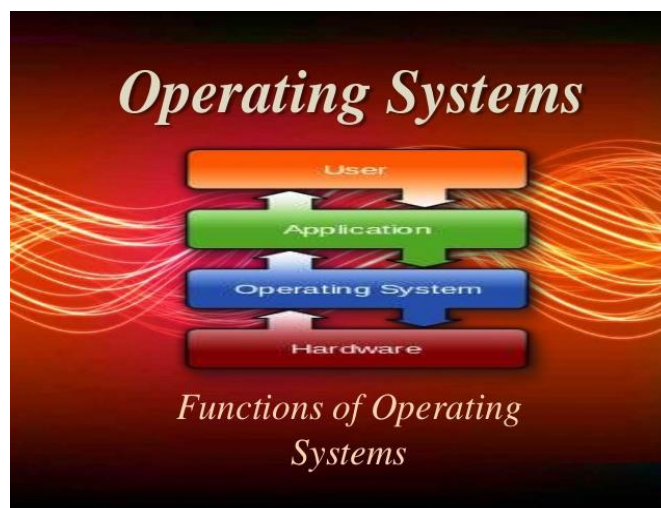
II. OPERATING SYSTEM:

Operating System (OS)is one of the core software programs that runs on the hardware and makes it usable for the user to interact with the hardware so that they can send commands (input) and receive results (output).

Figure: Operating system working as a core part

III The operating system's job:

Computer **operating system** (**OS**) manages all of the **software** and **hardware** on the computer. Most of the time, there are several different computer programs running at the same time, and they all need to access your computer's **central processing unit (CPU)**, **memory**, and **storage**. The operating system coordinates all of this to make sure each program gets what it needs.

COMPUTER BASED OPERATING SYSTEMS:

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- **Microsoft Windows**
- **Mac OS X**
- **Linux**.

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1. MICROSOFT WINDOWS

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- **Windows 10** (released in 2015),
- **Windows 8** (2012),
- **Windows 7** (2009), and
- **Windows Vista** (2007).

Windows comes **pre-loaded** on most new PCs, which helps to make it the **most popular operating system** in the world.

WINDOWS 7

Windows 7 is the most popular & used operating system worldwide. It is popular because of its great performance, ease of use, stability, compatibility and more.

WINDOWS XP

Windows XP is like the older Windows 7. XP is the another operating system from Microsoft.

WINDOWS 8.1

Windows 8.1 is the latest operating system from Microsoft. It is mainly an upgrade for Windows 8.

MAC OS X

Mac OS is a line of operating systems created by Apple. It comes preloaded on all new Macintosh computers, or Macs. All of the recent versions are known as

- **OS X** (pronounced O-S Ten),and the specific versions include
- **El Capitan** (released in 2015),
- **Yosemite** (2014),
- **Mavericks** (2013),
- **Mountain Lion** (2012),
- **Lion** (2011).

According to Stat Counter Global Stats, Mac OS X users account for less than **10%** of global operating systems—much lower than the percentage of Windows users (more than **80%**). One reason for this is that Apple computers tend to be more expensive.

LINUX

Linux (pronounced **LINN-ux**) is a family of **open-source** operating systems, which means they can be modified and distributed by anyone around the world. This is different from **proprietary software** like Windows, which can only be modified by the company that owns it. The advantages of Linux are that it is **free**, and there are many different **distributions.**

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UBUNTU OPERATING SYSTEM IN DESKTOP

WHAT IS UBUNTU:

Ubuntu is **a free desktop operating system**. It's based on Linux, a massive project that enables millions of people around the world to run machines powered by free and open software **on all kinds of devices**. Linux comes in many shapes and sizes, with Ubuntu being the most popular iteration on desktops and laptops.

Ubuntu is a computer **operating system** based on the Debian Linux distribution and distributed as free and open source software, using its own desktop environment.

Ubuntu Linux is **better** than Microsoft Windows 10. Windows 10 is a pretty

good desktop **operating system**. The release notes for **16.04**, **16.04**.1, and **16.04**.2 are available. Ubuntu is backed by a large company called Canonical.

HOW TO GET UBUNTU

There are two versions available:

- Long Term Support Release - 14.04
- Latest Version - 15.10
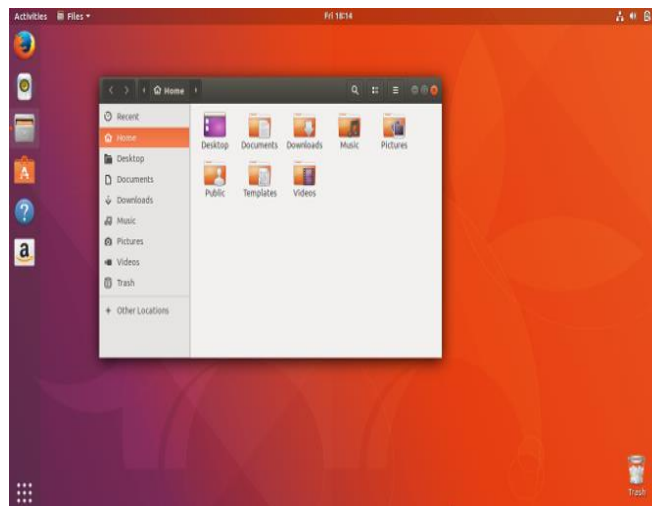
WHY USE UBUNTU:

There are many reasons to use Ubuntu, but here are some of the most important ones:

- **It's free and open source:**
  - shared code, shared efforts, shared principles, no cost.

- **It's easy to use, trial and install:**
  - you don't have to be an expert.
- **Ubuntu is beautiful, sleek, and stylish:**
  - learn more about the GNOME desktop environment
- **It's stable and fast:**
  - usually loads in less than a minute on modern computers.
  - It has no major viruses! Ubuntu is immune to computer-crashing Windows viruses.
- **It's up-to-date:**
  - Canonical releases new versions of Ubuntu every six months and also brings you regular updates for free.
- **It is supported:**
  - you can get all the support and advice you need from the global FOSS community and Canonical.
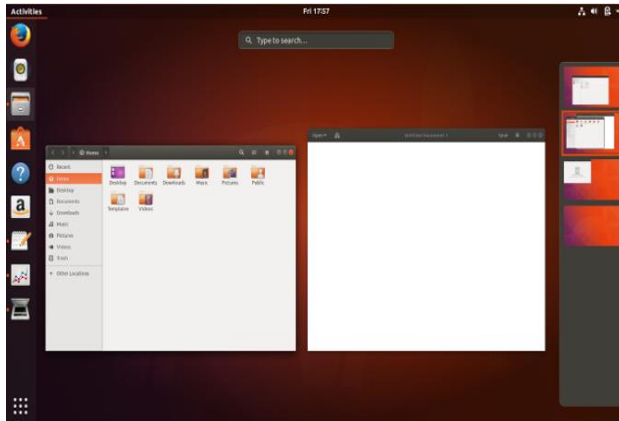 - Among Linux operating systems, Ubuntu is the most supported.

INSTALLING UBUNTU ON YOUR EXISTING COMPUTER

There are three primary ways to install Ubuntu on your computer:

- Replace your existing OS with Ubuntu
- Install Ubuntu alongside your existing OS
- Run Ubuntu off a USB stick

GETTING STARTED

When you sign into Ubuntu for the first time, you will see a screen that looks like this.

Workspaces

Workspaces appear on the right side of the activities overview, across from the dock. Think of workspaces as multiple desktops that all exist virtually on the same computer.

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A COMPLETE LIST OF ANDROID VERSION NAMES AND FEATURES – ANDROID OPERATING SYSTEM

Android is the most popular mobile operating system no doubt. Most of the credits for the popularity and adoption of Android goes to the fact that it's open by nature. Since the early days when the T-Mobile G1 was the only Android powered handset you could possibly get, the source code for the operating system has been available for everyone to download and play with. This article is geared towards going down the memory lane of Android version names with features, basically Android versions list and taking a look at what new features they brought in with them.

All About Android – Android Versions with List Names and Features

Before that let's look at the back story which I'm sure most of you aren't aware of. Before Android or any other fork of Android existed, there was a small mobile software company named Danger which was founded by a former Apple engineer Andy Rubin. What made Danger popular was Hiptop, a smartphone with a landscape keyboard and an interface which prioritized web browsing and messaging. Danger entered into a unique business model with Hiptop (later renamed to Sidekick) which facilitated for a revenue sharing mechanism.

ANDROID VERSION NAMES AND FEATURES

Table of Contents

In a way, it was Danger's services that were being sold rather than the hardware. Rubin was removed from the company Danger, but soon enough he founded Android Inc. When it was founded it was a purely software based company with no products to sell for 2 years. They

planned on focusing on creating the best possible web-connected experience and they believed that investors would come along if their product was great. Google at the time was looking for a mobile OS of its own, trying to compete with Microsoft and Blackberry (Oh! how have times changed). Google wanted more phones with Google as the default search engine and Android helped it achieve exactly that.

CONCLUSION – ANDROID VERSION NAMES AND FEATURES

Android as a platform has evolved significantly since its inception in 2008. The platform now powers more than 1 Billion users who use the platform daily. It has also become one of the biggest sources of revenue and has essentially driven the smartphone era forward with its forward-thinking features which have become so popular that recent versions of iOS have started implementing it.

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Mobile Operating Systems (Mobile OS) Explained

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A mobile operating system, also called a *mobile OS*, is an operating system that is specifically designed to run on mobile devices such as mobile phones, Smartphone, PDAs, tablet computers and other handheld devices. Much like the Linux or Windows operating system controls your desktop or laptop computer, a mobile operating system is the software platform on top of which other programs can run on mobile devices. The operating system is responsible for determining the functions and features available on your device, such as thumb wheel, keyboards, WAP, synchronization with applications, email, text messaging and more.

9 POPULAR MOBILE OPERATING SYSTEMS:

1. <u>Android OS (Google Inc.)</u>

The Android mobile operating system is Google's open and free software stack that includes an operating system, middleware and also key applications for use on mobile devices, including smartphones. Updates for the open source Android mobile operating system have been

developed under "dessert-inspired" version names (Cupcake, Donut, Eclair, Gingerbread, Honeycomb, Ice Cream Sandwich) with each new version arriving in alphabetical order with new enhancements and improvements.

2. Bada (Samsung Electronics)

Bada is a proprietary Samsung mobile OS that was first launched in 2010. The Samsung Wave was the first smartphone to use this mobile OS. Bada provides mobile features such as multipoint-touch, 3D graphics and of course, application downloads and installation.

3. BlackBerry OS (Research In Motion)

The BlackBerry OS is a proprietary mobile operating system developed by Research In Motion for use on the company's popular BlackBerry handheld devices. The BlackBerry platform is popular with corporate users as it offers synchronization with Microsoft Exchange, Lotus Domino, Novell GroupWise email and other business software, when used with the BlackBerry Enterprise Server.

4. iPhone OS / iOS (Apple)

Apple's iPhone OS was originally developed for use on its iPhone devices. Now, the mobile operating system is referred to as iOS and is supported on a number of Apple devices including the iPhone, iPad, iPad 2 and iPod Touch. The iOS mobile operating system is available only on Apple's own manufactured devices as the company does not license the OS for third-party hardware. Apple iOS is derived from Apple's Mac OS X operating system.

5. MeeGo OS (Nokia and Intel)

A joint open source mobile operating system which is the result of merging two products based on open source technologies: Maemo (Nokia) and Moblin (Intel). MeeGo is a mobile OS designed to work on a number of devices including smartphones, netbooks, tablets, in-vehicle information systems and various devices using Intel Atom and ARMv7 architectures.

6. Palm OS (Garnet OS)

The Palm OS is a proprietary mobile operating system (PDA operating system) that was originally released in 1996 on the Pilot 1000 handheld. Newer versions of the Palm OS have added support for expansion ports, new processors, external memory cards, improved security and support for ARM processors and smartphones. Palm OS 5 was extended to provide support for a broad range of screen resolutions, wireless connections and enhanced multimedia capabilities and is called Garnet OS.

7. Symbian OS (Nokia)

Symbian is a mobile operating system (OS) targeted at mobile phones that offers a high-level of integration with communication and personal information management (PIM) functionality. Symbian OS combines middleware with wireless communications through an integrated mailbox and the integration of Java and PIM functionality (agenda and contacts). Nokia has made the Symbian platform available under an alternative, open and direct model, to work with some OEMs and the small community of platform development collaborators. Nokia does not maintain Symbian as an open source development project.

8. webOS (Palm/HP)

WebOS is a mobile operating system that runs on the Linux kernel. WebOS was initially developed by Palm as the successor to its Palm OS mobile operating system. It is a proprietary Mobile OS which was eventually acquired by HP and now referred to as webOS (lower-case w) in HP literature. HP uses webOS in a number of devices including several smartphones and HP TouchPads. HP has pushed its webOS into the enterprise mobile market by focusing on improving security features and management with the release of webOS 3.x. HP has also announced plans for a version of webOS to run within the Microsoft Windows operating system and to be installed on all HP desktop and notebook computers in 2012.

9. Windows Mobile (Windows Phone)

Windows Mobile is Microsoft's mobile operating system used in smart phones and mobile devices – with or without touch screens. The Mobile OS is based on the Windows CE 5.2 kernel. In 2010 Microsoft announced a new smart phone platform called Windows Phone 7.

Recent launches in 2017:

* April-Samsung officially launched Android-based Samsung Experience custom UI starting with **version 8.1** on Samsung Galaxy S8
* April – Microsoft released Windows 10 Mobile Creators Update.
* May – Samsung officially introduce Tizen 4.0 at Tizen Developer Conference 2017.
* August – Google released Android 8.0 "Oreo"**.**
* August – BlackBerry announced the Android-based BlackBerry Secure which focus on security.
* September – Apple introduces the iPhone 8**,** iPhone X**,** and **iOS 11.**

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Development in Mobile Operating System

In 1993

> * *1973–1993* : Mobile phones use embedded systems to control operation.
> * *1994* – The first smartphone, the IBM Simon, has a touchscreen, email, and PDA features.
> * *1996* – Palm Pilot 1000 personal digital assistant is introduced with the Palm OS mobile operating system.
> * *1998* – Symbian Ltd. has developed Symbian OS. Symbian was used by many major mobile phone brands, and above all by Nokia.
> * *1999* – Nokia S40 Platform is introduced officially along with the Nokia 7110.

In 2000

> * *2000* – Symbian becomes the first modern mobile OS on a smartphone with the launch of the Ericsson R380.
> * *2001* – The Kyocera 6035 is the first smartphone with Palm OS.
> * *2002-* Microsoft's first Windows CE (Pocket PC) smartphones are introduced. BlackBerry releases its first smartphone.
> * *2005* – Nokia introduces Maemo OS on the first Internet tablet N770.

- *2007* - Apple iPhone with iOS is introduced as an iPod, "mobile phone" and "Internet communicator".Open Handset Alliance (OHA) formed by Google, HTC, Sony, Dell, Intel, Motorola, Samsung, LG, etc.
- *2008* – OHA releases Android (based on Linux kernel) 1.0 with the HTC Dream (T-Mobile G1) as the first Android phone.
- *2009* - Palm introduces webOS with the Palm Pre. By 2012, webOS devices were discontinued. Samsung announces the Bada OS with the introduction of the Samsung S8500.

In 2010

- *November* – Windows Phone OS phones are released but are not compatible with the priority Windows Mobile OS.

In 2011

- *July* – MeeGo, a mobile Linux distribution, combining Maemo and Moblin, is introduced with the Nokia N9, a collaboration of Nokia, Intel, and Linux Foundation.
- *September* – Samsung, Intel, and the Linux Foundation announced that their efforts will shift from Bada, MeeGo to Tizen during 2011 and 2012.
- *October* – The Mer project was announced, based on an ultra-portable core for building products, composed of Linux, HTML5, QML, and JavaScript, which was derived from the MeeGo codebase.

In 2012

- *July* – Mozilla announced that the project formerly named Boot to Gecko was now Firefox OS and had several handset OEMs on board.
- *September* – Apple releases iOS 6.

In 2013

- *January* – BlackBerry releases their new operating system for smartphones, BlackBerry 10.
- *September* – Apple releases iOS 7.
- *October* - Canonical announced Ubuntu Touch, a version of the Linux distribution expressly designed for smartphones. The OS is built on the Android Linux kernel, using Android drivers and services, but does not use any of the Java-like code of Android. Google releases Android KitKat 4.4.

In 2014

- *February* – Microsoft releases Windows Phone 8.1
- *September* - Apple releases iOS 8. BlackBerry release BlackBerry 10.3 with integration with the Amazon Appstore.
- *November* – Google releases Android 5.0 "Lollipop"

In 2015

- *February* – Google releases Android 5.1 Lollipop.
- *September* - Apple releases iOS 9.Google releases Android 6.0 Marshmallow.
- *October* – On October 26, BlackBerry announced that there are no plans to release new APIs and software development kits for BlackBerry 10, future updates would focus on security and privacy enhancements only.
- *November* – Microsoft releases Windows 10 Mobile.

In 2016

- *February* – Microsoft released Windows 10 Mobile Anniversary Update.
- *June* – Apple announced iOS 10.
- *August* – Google posted the Fuchsia source code on GitHub.
- *August* – Google released Android 7.0 "Nougat".
- *September* – Apple released iOS 10.
- *November* – Tizen released Tizen 3.0.
- *November* – BlackBerry released BlackBerry 10.3.3.

In 2017

- *April* – Samsung officially launched Android-based Samsung Experience custom UI starting with version 8.1 on Samsung Galaxy S8
- *April* – Microsoft released Windows 10 Mobile Creators Update.
- *August* – Google released Android 8.0 "Oreo".
- *August* – BlackBerry announced the Android-based BlackBerry Secure which focus on security.
- *September* – Apple introduces the iPhone 8, iPhone X, and iOS 11.
- *October* – On October 8, Microsoft announced that development of Windows 10 Mobile will be on maintenance mode only, thus there won't be any new feature would introduce to Windows 10 Mobile.

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SYMBIAN OPERATING SYSTEM FOR MOBILE PHONES

INTRODUCTION:

Symbian OS is officially the property of Nokia. It means that any other company will have to take permission from Nokia before using this operating system. Nokia has remained a

giant in the low-end mobile market, so after Java Symbian was the most used in the mobile phones till a couple of years ago. Still Symbian is widely used in low-end phonesbut the demand rate has been continuously decreasing. By upgrading Symbian mobile OS, Nokia has made it capable to run smartphones efficiently. Symbian ANNA and BELLE are the two latest updates that are currently used in Nokia's smartphones. Overall, the Symbian OS is excellently designed and is very user-friendly.

Some of the phones currently running on Symbian OS are Nokia C6-01, Nokia 603, Nokia 700, Nokia 808 Pure View, Nokia E6 (ANNA) and Nokia 701 (BELLE). Symbian is a popular choice among Nokia dual sim mobile phones as well.

Features:

User interface

Symbian has had a native graphics toolkit since its inception, known as AVKON (formerly known as Series 60). S60 was designed to be manipulated by a keyboard-like interface metaphor, such as the 15-key augmented telephone keypad, or the mini-QWERTY keyboards. AVKON-based software is binary-compatible with Symbian versions up to and including Symbian3.

Symbian3 includes the Qt framework, which is now the recommended user interface toolkit for new applications. Qt can also be installed on older Symbian devices.

Symbian4 was planned to introduce a new GUI library framework specifically designed for a touch-based interface, known as "UI Extensions for Mobile" or UIEMO (internal project name "Orbit"), which was built on top of Qt Widget; a preview was released in January 2010, however in October 2010 Nokia announced that Orbit/UIEMO had been cancelled.

MOBILE PHONE CORE PLATFORM: Central to data-enabled mobile phones is a fast,low power, low cost CPU core, which has compactcode and can be highly integrated with peripherals.A system-on-chip (SoC) contains the CPU core andvital peripherals for the functioning of the phoneoperating system. The family of ARM architectureRISC processors, which have been incorporatedwith core peripherals into a standard package, isparticularly suited for mobile phones. The system-on-chip is then placed on a PCB with the remainingperipherals to produce a phone.

Symbian OS is a 32-bit, little-endian operatingsystem. It has been ported to many flavors

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- Arabic (Arabic),
- Basque (Latin),
- Bulgarian (Cyrillic),
- Catalan (Latin),
- English [US] (Latin),
- Estonian (Latin),
- Finnish (Latin),
- French (Latin),etc

OTHER LANGUAGES:.

- Symbian devices can also be programmed using Python, Java ME, Flash Lite, Ruby, .NET, Web Runtime (WRT) Widgets and StandardC/C++.
- Visual Basic programmers can use NS Basic to develop apps for S60 3rd Edition and UIQ 3 devices.
- There is also a version of a Borland IDE for Symbian OS. Symbian OS development is also possible on Linux and Mac OS X using tools and methods developed by the community, partly enabled by Symbian releasing the source code for key tools. A plugin that allows development of Symbian OS applications in Apple's Xcode IDE for Mac OS X was available.
- Java ME applications for Symbian OS are developed using standard techniques and tools such as the Sun Java Wireless Toolkit (formerly the J2ME Wireless Toolkit). They are packaged as JAR (and possibly JAD) files. Both CLDC and CDC applications can be created with NetBeans. Other tools include SuperWaba, which can be used to build Symbian 7.0 and 7.0s programs using Java.
- Nokia S60 phones can also run Python scripts when the interpreter Python for S60 is installed, with a custom made API that allows for Bluetooth support and such. There is also an interactive console to allow the user to write Python scripts directly from the phone.

APPLICATION SUPPORT:

Symbian OS is fully multi-tasking. To ensure the system to run in an efficient and secure manner, some properties are imposed on applications. All applications run in a virtual machine

(VM) environment. One benefit is that software can be fixed- -up (built with predefined run-time memory configuration) such that the environment is exactly as expected. This saves memory, because the library does not need to have any relocation information associated with it. Also if there are two copies of the application running they can execute the same code.

OPERATING SYSTEM:

The All over Model contains the following layers, from top to bottom:

- UI Framework Layer
- Application Services Layer
  - Java ME
- OS Services Layer
  - generic OS services
  - communications services
  - multimedia and graphics services
  - connectivity services
- Base Services Layer
- Kernel Services & Hardware Interface Layer

MALWARE:

Symbian OS is subject to a variety of viruses, the best known of which is Cabir. Usually these send themselves from phone to phone by Bluetooth. So far, none have taken advantage of any flaws in Symbian OS – instead, they have all asked the user whether they would like to install the software.

CONCLUSION:

Symbian OS is a robust multi-tasking operating system, designed specifically for real-world wireless environments and the constraints of mobile phones (including limited amount of memory). Symbian OS is natively IP-based, with fully integrated communications and messaging. It supports all the leading industry standards that will be essential for this generation of data-enabled mobile phones. Symbian OS enables a large community of developers.

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Mobile operating system(BLACK BERRY, ANDROID)

A **mobile operating system** (or **mobile OS**) is an operating system for phones, tablets, smart watches, or other mobile devices. While computers such as typical laptops are 'mobile', the operating systems usually used on them are not considered mobile ones, as they were originally designed for desktop computers that historically did not have or need specific mobile features. This distinction is becoming blurred in some newer operating systems that are hybrids made for both uses.

Mobile operating systems combine features of a personal computer operating system with other features useful for mobile or handheld use; usually including, and most of the following considered essential in modern mobile systems; a touch screen, cellular, Bluetooth, Wi-Fi Protected Access, Wi-Fi, Global Positioning System (GPS) mobile navigation, video- and single-frame picture cameras, speech recognition, voice recorder, music player, near field communication, and infrared blaster. By the end of 2016, over 430 million smartphones were sold with 81.7 percent running Android, 17.9 percent running iOS, 0.3 percent running Windows 10 Mobile (no longer marketed) and the other OSes cover 0.1 percent. Android alone is more popular than the popular desktop operating system Windows, and in general smartphone use (even without tablets) outnumbers desktop use (desktop use, web use, overall is down to 44.9% in the first quarter of 2017).

Mobile devices with mobile communications abilities (e.g., smartphones) contain two mobile operating systems – the main user-facing software platform is supplemented by a second low-level proprietary real-time operating system which operates the radio and other hardware. Research has shown that these low-level systems may contain a range of security vulnerabilities permitting malicious base stations to gain high levels of control over the mobile device.

Mobile operating systems have majority use as of 2017 (measured by web use); with even only the smartphones running them (excluding tablets) more used than any other kind of device. Thus traditional desktop OS is now a minority used kind of OS; see usage share of operating systems. However, variations occur in popularity by regions, while desktop-minority also applies on some days in regions such as United States and United Kingdom.

Android

Android 6.x Marshmallow on a Google Nexus 5X

Android (based on the modified Linux kernel) is a mobile operating system developed by Google Inc. Besides having the largest installed base worldwide on smartphones, it is also the most popular operating system for general purpose computers (a category that includes desktop computers and mobile devices), even though Android is not a popular operating system for regular (desktop) personal computers (PCs). Although the Android operating system is free and open-source software, in devices sold, much of the software bundled with it (including Google apps and vendor-installed software) is proprietary softwareand closed source.

Android's releases before 2.0 (1.0, 1.5, 1.6) were used exclusively on mobile phones. Android 2.x releases were mostly used for mobile phones but also some tablets, Android 3.0 was a tablet-oriented release and does not officially run on mobile phones, while both phone and tablet compatibility was merged with Android 4.0. The current Android version is 8.0 Oreo.

Google Android 5.0, 6.0 and 7.0

Android's releases are named after sweets or dessert items, except for the first and second releases:

- 1.0 – (No codename) (API Level 1)
- 1.1 – (Internally known as "Petit Four") (API Level 2)
- 1.5 – Cupcake: (API Level 3)
- 1.6 – Donut: (API Level 4)
- 2.0 – Eclair: (API Level 5)
- 2.0.1 – Eclair: (API Level 6)
- 2.1 – Eclair: (API Level 7)
- 2.2.x – Froyo (for "Frozen Yogurt"): (API Level 8)
- 2.3 – Gingerbread (minor UI tweak): (API Level 9)
- 2.3.3 – Gingerbread: (API Level 10)
- 3.0 – Honeycomb (major UI revamp): (API Level 11)
- 3.1 – Honeycomb: (API Level 12)
- 3.2 – Honeycomb: (API Level 13)
- 4.0 – Ice Cream Sandwich (minor UI tweak): (API Level 14)
- 4.0.3 – Ice Cream Sandwich: (API Level 15)

- 4.1 – Jelly Bean: (API Level 16)

- 4.2 – Jelly Bean: (API Level 17)

- 4.3 – Jelly Bean: (API Level 18)

- 4.4.4 – Kit Kat: (API Level 19)

- 5.0, 5.0.1, 5.0.2 – Lollipop (major UI revamp): (API Level 21)

- 5.1, 5.1.1 – Lollipop: (API Level 22)

- 6.0 & 6.0.1 – Marshmallow: (API Level 23)

- 7.0 – Nougat (API Level 24)

- 7.1, 7.1.1 – Nougat (API Level 25)

- 8.0 – Oreo (minor UI tweak): (API Level 26)

BlackBerry Secure

BlackBerry Secure is an operating system developed by BlackBerry, based on the Android Open Source Project (AOSP). Officially announced the name for their Android based front-end touch interface on August 2017, before the announcement, BlackBerry Secure was running on BlackBerry brand devices such as BlackBerry Priv, DTEK 50/60 and BlackBerry KEY one. Currently, BlackBerry plan to license out the BlackBerry Secure to other OEM's.

Current BlackBerry Secure version list

- BlackBerry Secure version 1.x (based on Android "Marshmallow" 6.x and "Nougat" 7.x) (initial release and minor UI update for devices that support Android Nougat)

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ANDROID 7.0

➤ Android "Nougat" (codenamed Android N during development) is the seventh major version of the Android operating system. First released as an alpha test version on March 9, 2016, it was officially released on August 22, 2016, with Nexus devices being the first to receive the update.

- Android 7.0 Nougat is rolling out now, starting (as usual) with Nexus devices and eventually moving on to other phones. ... The new OS is loaded with new features and refinements, each one improving upon the overall Android experience.

- Android Alpha and Android Beta, Google has always named its Android OS updates after sweet treats, and in alphabetical order. So far we've had Cupcake, Donut, Eclair, Froyo, Gingerbread, Honeycomb, Ice Cream Sandwich, Jelly Bean, KitKat, Lollipop and Marshmallow.

- The latest version is Android 7 Nougat, which will become available for more devices over the coming months. Android O is available in beta form, and will be released later this year. Meanwhile, Marshmallow is version 6.x, Lollipop is 5.x, KitKat is 4.4.x, and 4.3, 4.2 and 4.1 are all Jelly Bean.

ANDROID VERSION HISTORY :

Code name	Version number	Initial release date
KitKat	4.4 – 4.4.4	October 31, 2013
Lollipop	5.0 – 5.1.1	November 12, 2014
Marshmallow	6.0 – 6.0.1	October 5, 2015
Nougat	7.0 – 7.1.2	August 22, 2016
Oreo	8.0 – 8.1	August 21, 2017

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LISTS OF MOBILE OPERATING SYSTEM

Code name	Version number	Initial release date	API level	Security patches
Oreo	8.0 – 8.1	August 21, 2017	26 – 27	Supported
Nougat	7.0 – 7.1.2	August 22, 2016	24 – 25	Supported

Code name	Version number	Initial release date	API level	Security patches
Marshmallow	6.0 – 6.0.1	October 5, 2015	23	Supported
Lollipop	5.0 – 5.1.1	November 12, 2014	21 – 22	Supported

Legend:

Old version

Older version, still supported

Latest version

KitKat	4.4 – 4.4.4	October 31, 2013	19 – 20	Unsupported
Jelly Bean	4.1 – 4.3.1	July 9, 2012	16 – 18	Unsupported
Ice Cream Sandwich	4.0 – 4.0.4	October 18, 2011	14 – 15	Unsupported
Honeycomb	3.0 – 3.2.6	February 22, 2011	11 – 13	Unsupported
Gingerbread	2.3 – 2.3.7	December 6, 2010	9 – 10	Unsupported
Froyo	2.2 – 2.2.3	May 20, 2010	8	Unsupported

Code name	Version number	Initial release date	API level	Security patches
Eclair	2.0 – 2.1	October 26, 2009	5 – 7	Unsupported
Donut	1.6	September 15, 2009	4	Unsupported
Cupcake	1.5	April 27, 2009	3	Unsupported
(No codename)	1.0	September 23, 2008	1	Unsupported
(Internally known as "Petit Four")	1.1	February 9, 2009	2	Unsupported

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OPERATING SYSTEM USING COMPUTERS

Operating Systems:

A computer's operating system is one of the most important "parts" of the computer. Almost every type of computer—including mobile telephones, video game systems, E-book readers, and DVRs—needs an operating system in order to operate properly.

WHAT OPERATING SYSTEMS DO?

One of the operating system's main tasks is to control the computer's resources—both the hardware and the software. The operating system allocates resources as necessary to ensure that each application receives the appropriate amount. Developers face the challenge of keeping the operating system flexible enough to control hardware from the thousands of different computer manufacturers.

1. Processor management. The operating system needs to allocate enough of the processor's time to each process and application so that they can run as efficiently as possible. This is particularly important for multitasking.

2. Memory storage and management. The operating system needs to ensure that each process has enough memory to execute the process, while also ensuring that one process does not use the memory allocated to another process.

3. Device management. The devices like printer, scanner require drivers, or special programs that translate the electrical signals sent from the operating system or application program to the hardware device.

4. Application interface. Programmers use application program interfaces (APIs) to control the computer and operating system. So the programmer does not need to know the details of controlling the hardware.

5. User interface. The user interface sits as a layer above the operating system. It is the part of the application through which the user interacts with the application.

TYPES OF OPERATING SYSTEMS

There are four general types of operating systems.

1. Real-time operating systems (RTOS) are used to control machinery, scientific instruments, and industrial systems.

2. Single-user, single-task operating systems allow one user to do one thing at a time
3. Single-user, multi-tasking operating systems allow a single user to simultaneously run multiple applications on their computer.

4. Multi-user operating systems allow multiple users to simultaneously use the resources on a single computer. Unix is an example of a multi-user operating system.

10 different features :

- Mac OS X, Time Machine.
- Unix, The Shell Terminal.
- Ubuntu, Simplified Linux Setup.
- BeOS, 64-Bit Journaling File System.
- IRIX, SGI Dogfight.
- NeXTSTEP, Right-Click Context Menu.
- MS-DOS, BASIC.
- Windows 3.0, Alt-Tab Task Switching.

Examples :

\# GNU.

\# UNIX, BSD.

\# Haiku, Windows (XP, Vista, 7) and Mac OS.

\# Linux, GNU/Linux.

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OPERATING SYSTEM IN MOBILE

Much like the Linux or Windows operating system controls your desktop or laptop computer, a mobile operating system is the software platform on top of which other programs can run on mobile devices.A mobile operating system, also called a mobile OS, is an operating system that is specifically designed to run on mobile devices such as mobile phones, smartphones, PDAs, tablet computers and other handheld devices.

The mobile OS will also determine which third-party applications (mobile apps) can be used on your device.

TYPES OF MOBILE OPERATING SYSTEMS

Different types of mobile OS's

Mobile OS

Symbian OS | iPhone OS | RIM BlackBerry | Windows Mobile | Linux | Palm OS | Android

1. Android OS (Google Inc.)

➤ It is Google's open and free software stack that includes an operating system, middleware and also key applications for use on mobile devices, including smartphones.

➤ Updates for the open source Android mobile operating system have been developed under "dessert-inspired" version names (Cupcake, Honeycomb, Ice Cream Sandwich) with each new version arriving in alphabetical order with new enhancements and improvements.

2. Bada (Samsung Electronics)

➤ Bada is a proprietary Samsung mobile OS that was first launched in 2010.

➤ The Samsung Wave was the first smartphone to use this mobile OS. Bada provides mobile features such as multipoint-touch, 3D graphics and of course, application downloads and installation.

3. BlackBerry OS (Research In Motion)

➤ The BlackBerry OS is a proprietary mobile operating system developed by Research In Motion for use on the company's popular BlackBerry handheld devices.

➤ The BlackBerry platform is popular with corporate users as it offers synchronization with Microsoft Exchange, Lotus Domino, Novell GroupWise email and other business software, when used with the BlackBerry Enterprise Server.

4. iPhone OS / iOS (Apple)

- ➢ Apple's iPhone OS was originally developed for use on its iPhone devices.
- ➢ Now, the mobile operating system is referred to as iOS and is supported on a number of Apple devices including the iPhone, iPad, iPad 2 and iPod Touch.
- ➢ The iOS mobile operating system is available only on Apple's own manufactured devices as the company does not license the OS for third-party hardware.
- ➢ Apple iOS is derived from Apple's Mac OS X operating system.

5. MeeGo OS (Nokia and Intel)

- ➢ A joint open source mobile operating system which is the result of merging two products based on open source technologies: Maemo (Nokia) and Moblin (Intel).
- ➢ MeeGo is a mobile OS designed to work on a number of devices including smartphones, netbooks, tablets, in-vehicle information systems and various devices using Intel Atom and ARMv7 architectures.

6. Palm OS (Garnet OS)

- ➢ The Palm OS is a proprietary mobile operating system (PDA operating system) that was originally released in 1996 on the Pilot 1000 handheld.
- ➢ Newer versions of the Palm OS have added support for expansion ports, new processors, external memory cards, improved security and support for ARM processors and smartphones.
- ➢ Palm OS 5 was extended to provide support for a broad range of screen resolutions, wireless connections and enhanced multimedia capabilities and is called Garnet OS.

7. Symbian OS (Nokia)

- ➢ Symbian is a mobile operating system (OS) targeted at mobile phones that offers a high-level of integration with communication and personal information management (PIM) functionality.
- ➢ Symbian OS combines middleware with wireless communications through an integrated mailbox and the integration of Java and PIM functionality (agenda and contacts).
- ➢ Nokia has made the Symbian platform available under an alternative, open and direct model, to work with some OEMs and the small community of platform development collaborators. Nokia does not maintain Symbian as an open source development project.
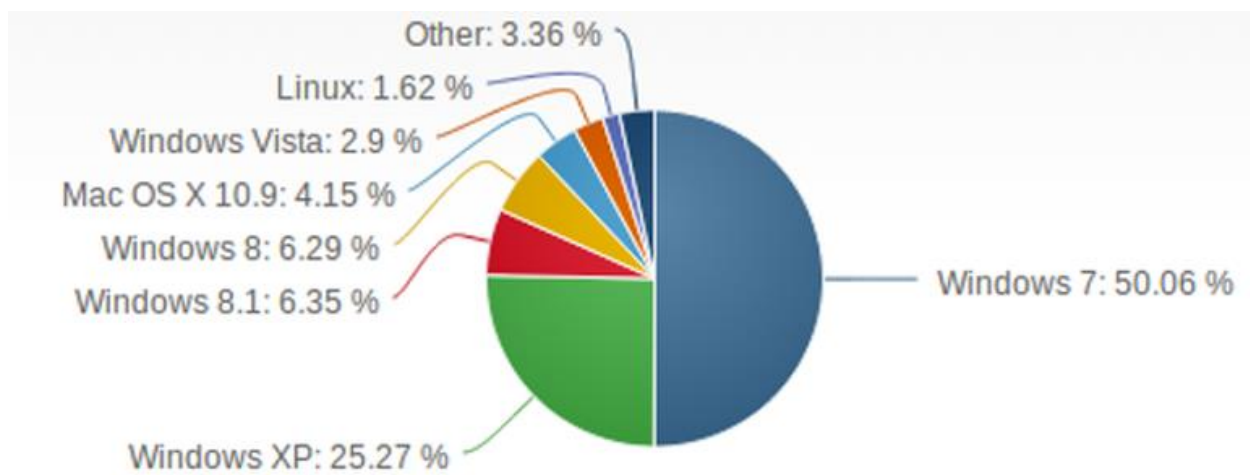
8. webOS (Palm/HP)

- ➢ WebOS is a mobile operating system that runs on the Linux kernel.
- ➢ WebOS was initially developed by Palm as the successor to its Palm OS mobile operating system. It is a proprietary Mobile OS which was eventually acquired by HP and now referred to as webOS (lower-case w) in HP literature.

- HP uses webOS in a number of devices including several smartphones and HP TouchPads. HP has pushed its webOS into the enterprise mobile market by focusing on improving security features and management with the release of webOS 3.x.
- HP has also announced plans for a version of webOS to run within the Microsoft Windows operating system and to be installed on all HP desktop and notebook computers in 2012.

**9. Windows Mobile (Windows Phone)**

- Windows Mobile is Microsoft's mobile operating system used in smartphones and mobile devices – with or without touchscreens.
- The Mobile OS is based on the Windows CE 5.2 kernel. In 2010 Microsoft announced a new smartphone platform called Windows Phone 7.

Market share in the 2016 year:

Other: 3.36 %
Linux: 1.62 %
Windows Vista: 2.9 %
Mac OS X 10.9: 4.15 %
Windows 8: 6.29 %
Windows 8.1: 6.35 %
Windows XP: 25.27 %
Windows 7: 50.06 %

Operating system in computer:

An operating system or OS is a software on the hard drive that enables the computer hardware to communicate and operate with the computer software. Without a computer operating system, a computer and software programs would be useless. The picture to the right is an example of Microsoft Windows XP, a popular operating system and what the box may look like if you were to purchase it from a local retail store.
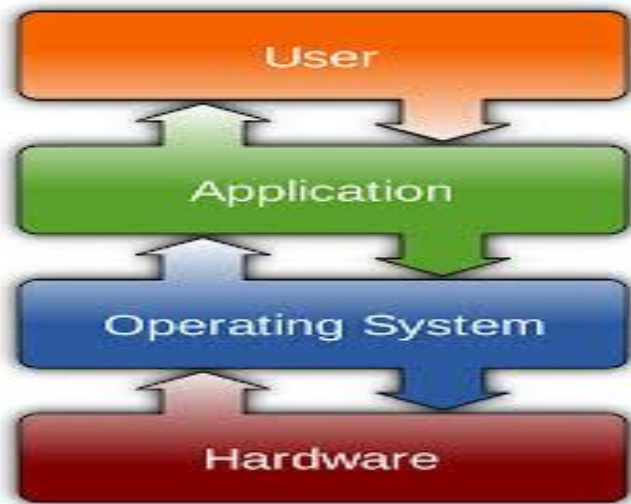
Operating System types

1. GUI
Short for Graphical User Interface, a GUI operating system contains graphics and icons and is commonly navigated by using a computer mouse. See the GUI definition for a complete definition.
Examples of GUI operating systems are:
System 7.x
Windows 98
Windows CE

2. Multi-user
A multi-user operating system allows for multiple users to use the same computer at the same time and different times. See the multi-user definition for a complete definition.
Examples of operating systems that would fall into this category are:
Linux
Unix
Windows 2000

3. Multiprocessing
An operating system capable of supporting and utilizing more than one computer processor.
Examples of operating systems that would fall into this category are:
Linux
Unix
Windows XP

4.Multitasking

An operating system that is capable of allowing multiple software processes to run at the same time.
 Examples of operating systems that would fall into this category are:
Linux
Unix
Windows 8

5.Multithreading

Operating systems that allow different parts of a software program to run concurrently.
 Examples of operating systems that would fall into this category are:
Linux
Unix
Windows XP

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VOICE ID (VOICE AUTHENTICATION)

Voice ID technology is an amazing leap...

The criteria that a voice ID system bases decisions on are created by the shape of the speaker's mouth and throat, rather than more variable conditions. Because of the relative permanence of the characteristics it measures, the technology is not likely to be fooled by an attempt to disguise a voice, and is not generally affected by changes that can make a voice sound quite different to the human ear, such as a bad cold or extreme emotion. During enrollment for a voice authentication system, a user's voice is recorded, creating what is called a voiceprint for comparison with samples taken for user identification. To foil attempts to fool the system with a prerecorded voice sample, people may be asked to read or repeat a list of words which they can then be requested to repeat in random combinations.

Voice ID systems have been used in a variety of security-related applications. The United States judicial system has used the technology, on a limited basis, for about 10 years to ensure that prisoners incarcerated in their homes or out on temporary passes were where they were supposed to be. Voice-based systems could potentially be used effectively in any situation where secure

authentication is especially important. Banks and credit card companies are increasingly turning to voice authentication as a means of decreasing the potential for fraud and identity theft and, at the same time, cutting the costs associated with customer verification.

Voice authentication products are available from a number of vendors, including Vocent, Nuance Communications, Courion Corp., and VoiceVault.

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FOG COMPUTING

Fog computing or **fog networking**, also known as **fogging**, is an architecture that uses one or more collaborative end-user clients or near-user edge devices to carry out a substantial amount of storage (rather than stored primarily in cloud data centers), communication (rather than routed over the internet backbone), control, configuration, measurement and management (rather than controlled primarily by network gateways such as those in the LTE core network).

Fog computing can be perceived both in large cloud systems and big data structures, making reference to the growing difficulties in accessing information objectively. This results in a lack of quality of the obtained content. The effects of fog computing on cloud computing and big data systems may vary; yet, a common aspect that can be extracted is a limitation in accurate content distribution, an issue that has been tackled with the creation of metrics that attempt to improve accuracy. Fog networking supports the Internet of Things (IoT) concept, in which most of the devices used by humans on a daily basis will be connected to each other. Examples include phones, wearable health monitoring devices, connected vehicle and augmented reality using devices such as the Google Glass.

ISO/IEC 20248 provides a method whereby the data of objects identified by edge computing using Automated Identification Data Carriers [AIDC], a barcode and/or RFID tag, can be read, interpreted, verified and made available into the "Fog" and on the "Edge" even when the AIDC tag has moved on. Fog computing is a medium weight and intermediate level of computing power.

Mist computing – a lightweight and rudimentary form of computing power that resides directly within the network fabric at the extreme edge of the network fabric using microcomputers and microcontrollers to feed into Fog Computing nodes and potentially onward towards the Cloud Computing platforms.

Applications of Fog Computing

- Smart traffic lights
- Connected car
- Smart grids
- Self maintaining train
- Wireless sensor and actuator networks(WSAN)
- Smart building control
- IoT and Cyber-Physical Systems (CPSs)
- Software defined Networks (SDN)

GOOGLE 2017

Google just concluded its I/O 2017 keynote, where executives led by CEO Sundar Pichai laid out the company's future roadmap for Android, Google Assistant, Google Home, virtual reality, and much more. Skydiving Google Glass-wearers, giant phone giveaways, and major hardware announcements no longer rule Google's biggest annual conference. Instead, the company has settled into a pattern of releasing information about what it's doing (and what it wants to do) for developers at I/O, instead of trying to wow consumers or the press.

ANDROID - Android's mobile dominance hasn't stopped growing. CEO Sundar Pichai revealed at the keynote's start that the tally of monthly active Android devices now exceeds 2 billion. That includes smartphones, tablets, Android Wear devices, Android TVs, and any other number of other gadgets that are based on the operating system.

GOOGLE ASSISTANT can now analyze the world around you with the help of your smartphone camera. Using a technology the company calls Google Lens; the Assistant will analyze your surroundings and display relevant content on your screen. You'll see a restaurant's rating when pointing your phone at the storefront, you can aim it at a flower and it will identify the species, and you can even pull up a band's music or videos by pointing Lens at a concert

poster. But the most useful example might be this: if you point Lens at Wi-Fi login credentials, your Android phone will be able to use that info to log on to that network. Google's not the first company to try to add artificial intelligence to a smartphone's camera. Samsung recently launched "Bixby Vision" on the Galaxy S8, a sight-based version of its own Bixby digital assistant, for example. And Snapchat (and now Instagram) are using low-level AI to apply goofy filters to your face. But Google's offering much more with Lens than just image recognition, shopping, or face filters. And while Facebook is exploring similar computer vision efforts, Google is trying to do it sooner than later with Lens.

Assistant is expanding beyond Android to iOS. Google Assistant will be a standalone app on iPhone and iPad, offering many of the same functions as what we've seen it do on Google's own operating system. You don't have to wait long to try it, either; its available starting today.

Google's smart speaker was already one of the best ones on the market, but the company announced a suite of other new features and updates beyond calling to Home that make it much more powerful. Home is now going to be able to control HBO Now, Hulu, SoundCloud, Deezer, and more. Even better, Google is opening up access to Home's Bluetooth radio, meaning you can treat it just like any other Bluetooth speaker. Home is also becoming more useful away from the device itself. Google showed off what it's calling "visual responses." Using Google Assistant, Home will now be more capable of directing the right information to the right connected screen. Say something like: "OK Google, show my calendar for today" and Home can instantly display your day's events on a Chrome cast-connected TV. Ask Home for directions to a place or event and it will send the directions right to the Google Maps app on your phone.

Google Photos is getting a slew of great additions. The app will now recommend that you share photos you've taken with people that it recognizes as being in the shot. Google calls this Suggested Sharing. It's also introducing Shared Libraries, which allow families to collectively add images to a central collection more easily. But Google is emphasizing control, here: you can share your entire photo library, share only from a certain date, or share photos that include certain things like your kids. Digital backups are great, but what if you want physical memories? Google now offers printed photo books. Books can be created directly on your Smartphone. Google will even recommend books to you when it thinks a particular collection makes sense.

Books are available beginning today for prices that start at only $9.99. And in the future, Google said that Photos will be able to automatically remove unwanted items in your shots

Google's VR ambitions are expanding beyond Daydream's current form, which involves strapping your Smartphone to your face. The company announced that upcoming headsets from partners including HTC and Lenovo won't require a Smartphone or PC to power the user's VR experience. You just put it on and it works. The headsets track virtual space with something Google calls "World Sense," powered by technology from its Tango augmented reality system. Unfortunately, we didn't hear exactly when this standalone vision will become reality. Google just offers a vague "coming soon."

Google is launching its preview program for **Android O**, and the first beta is being released today. We're still in the pretty early days of Android O's development, so you shouldn't install this preview on your everyday Smartphone. But if you're dying to check out the big new features — improved notifications, picture-in-picture, and more — you can enroll a compatible Pixel or Nexus device and begin testing out Android O. Bringing the "next billion" users online with Smartphone technology has been a major focus for Pichai since he took over as Google CEO in 2015. Today, the company announced one way it's going to try to reach that goal: Android Go, a version of the mobile operating system built for entry-level devices that are optimized for being used in data-restricted environments.

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LANGUAGES USED

YouTube   **:** Java script, C, C++, Python, Java

Google   **:** Java script, C, C++, Python, Java

Yahoo   **:** Java script, PHP

Amazon   **:** Java script, Java, C++, Perl

Microsoft   **:** Java script, ASP.NET

Wikipedia   **:** Java script, PHP, Hack

eBay.com   **:** Java script, Java, Scala

Pinternet   **:** Java script, Django (Python), Erlang

MSN   **:** Java script, ASP.NET

Twitter   **:** Java script, C++, Java, Scala, Ruby on Rails

Face book   **:** Java script, Hack, PHP, Python, C++, Java, Erlang

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