Windows Operating System

Objective: At the end of this exercise you shall be able to
- **list out the windows versions and features**

Windows versions and its features

Microsoft Windows has seen nine major versions since its first release in 1985. Over 29 years later, Windows looks very different but somehow familiar with elements that have survived the test of time, increases in computing power and - most recently - a shift from the keyboard and mouse to the touchscreen.

Here's a brief look at the history of Windows, from its birth at the hands of Bill Gates with Windows 1 to the latest arrival under new Microsoft chief executive SatyaNadella.

Windows 1

The first version of Windows

This is where it all started for Windows. The original Windows 1 was released in November 1985 and was Microsoft's first true attempt at a graphical user interface in 16-bit.

Development was spearheaded by Microsoft founder Bill Gates and ran on top of MS-DOS, which relied on command-line input.

It was notable because it relied heavily on use of a mouse before the mouse was a common computer input device. To help users become familiar with this odd input system, Microsoft included a game, Reversi (visible in the screenshot) that relied on mouse control, not the keyboard, to get people used to moving the mouse around and clicking onscreen elements.

Windows 2

Windows 2 with overlapping windows.

Two years after the release of Windows 1, Microsoft's Windows 2 replaced it in December 1987. The big innovation for Windows 2 was that windows could overlap each other, and it also introduced the ability to minimise or maximise windows instead of "iconising" or "zooming".

The control panel, where various system settings and configuration options were collected together in one place, was introduced in Windows 2 and survives to this day.

Microsoft Word and Excel also made their first appearances running on Windows 2.

Windows 3

Windows 3.0 got colourful.

The first Windows that required a hard drive launched in 1990. Windows 3 was the first version to see more widespread success and be considered a challenger to Apple's Macintosh and the Commodore Amiga graphical user interfaces, coming pre-installed on computers from PC-compatible manufacturers including Zenith Data Systems.

Windows 3 introduced the ability to run MS-DOS programmes in windows, which brought multitasking to legacy programmes, and supported 256 colours bringing a more modern, colourful look to the interface.

More important - at least to the sum total of human time wasted - it introduced the card-moving timesink (and mouse use trainer) Solitaire.

Windows 3.1

Windows 3.1 with Minesweeper.

Windows 1 and 2 both had point release updates, but Windows 3.1 released in 1992 is notable because it introduced TrueType fonts making Windows a viable publishing platform for the first time.

Minesweeper also made its first appearance. Windows 3.1 required 1MB of RAM to run and allowed supported MS-DOS programs to be controlled with a mouse for the first time. Windows 3.1 was also the first Windows to be distributed on a CD-ROM, although once installed on a hard drive it only took up 10 to 15MB (a CD can typically store up to 700MB).

Windows 95

Windows 95: oh hello Start menu.

As the name implies, Windows 95 arrived in August 1995 and with it brought the first ever Start button and Start.

It also introduced the concept of "plug and play" - connect a peripheral and the operating system finds the appropriate drivers for it and makes it work. That was the idea; it didn't always work in practice.

Windows 95 also introduced a 32-bit environment, the task bar and focused on multitasking. MS-DOS still played an important role for Windows 95, which required it to run some programmes and elements.

Internet Explorer also made its debut on Windows 95, but was not installed by default requiring the Windows 95 Plus! pack. Later revisions of Windows 95 included IE by default, as Netscape Navigator and NCSA Mosaic were popular at the time.

Windows 98

Windows 98, the last great DOS-based Windows.

Released in June 1998, Windows 98 built on Windows 95 and brought with it IE 4, Outlook Express, Windows

Address Book, Microsoft Chat and NetShow Player, which was replaced by Windows Media Player 6.2 in Windows 98 Second Edition in 1999.

Windows 98 introduced the back and forward navigation buttons and the address bar in Windows Explorer, among other things. One of the biggest changes was the introduction of the Windows Driver Model for computer components and accessories - one driver to support all future versions of Windows.

USB support was much improved in Windows 98 and led to its widespread adoption, including USB hubs and USB mice.

Windows ME

Windows ME was one to skip.

Considered a low point in the Windows series by many - at least, until they saw Windows Vista - Windows Millennium Edition was the last Windows to be based on MS-DOS, and the last in the Windows 9x line.

Released in September 2000, it was the consumer-aimed operating system twined with Windows 2000 aimed at the enterprise market. It introduced some important concepts to consumers, including more automated system recovery tools.

IE 5.5, Windows Media Player 7 and Windows Movie Maker all made their appearance for the first time. Autocomplete also appeared in Windows Explorer, but the operating system was notorious for being buggy, failing to install properly and being generally poor.

Windows 2000

Windows 2000 was ME's enterprise twin.

The enterprise twin of ME, Windows 2000 was released in February 2000 and was based on Microsoft's business-orientated system Windows NT and later became the basis for Windows XP.

Microsoft's automatic updating played an important role in Windows 2000 and became the first Windows to support hibernation.

Windows XP

Windows XP still survives to this day.

Arguably one of the best Windows versions, Windows XP was released in October 2001 and brought Microsoft's enterprise line and consumer line of operating systems under one roof.

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It was based on Windows NT like Windows 2000, but brought the consumer-friendly elements from Windows ME. The Start menu and task bar got a visual overhaul, bringing the familiar green Start button, blue task bar and vista wallpaper, along with various shadow and other visual effects.

ClearType, which was designed to make text easier to read on LCD screens, was introduced, as were built-in CD burning, autoplay from CDs and other media, plus various automated update and recovery tools, that unlike Windows ME actually worked.

Windows XP was the longest running Microsoft operating system, seeing three major updates and support up until April 2014 - 13 years from its original release date. Windows XP was still used on an estimated 430m PCs when it was discontinued.

Its biggest problem was security: though it had a firewall built in, it was turned off by default. Windows XP's huge popularity turned out to be a boon for hackers and criminals, who exploited its flaws, especially in Internet Explorer, mercilessly - leading Bill Gates to initiate a "Trustworthy Computing" initiative and the subsequent issuance of to Service Pack updates that hardened XP against attack substantially.

Windows Vista

Windows Vista, arguably worse than Windows ME.

Windows XP stayed the course for close to six years before being replaced by Windows Vista in January 2007. Vista updated the look and feel of Windows with more focus on transparent elements, search and security. Its development, under the codename "Longhorn", was troubled, with ambitious elements abandoned in order to get it into production.

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It was buggy, burdened the user with hundreds of requests for app permissions under "User Account Control" - the outcome of the Trustworthy Computing initiative which now meant that users had to approve or disapprove attempts by programs to make various changes.

The problem with UAC was that it led to complacency, with people clicking "yes" to almost anything - taking security back to the pre-UAC state. It also ran slowly on older computers despite them being deemed as "Vista Ready" - a labelling that saw it sued because not all versions of Vista could run on PCs with that label.

PC gamers saw a boost from Vista's inclusion of Microsoft's DirectX 10 technology.

Windows Media Player 11 and IE 7 debuted, along with Windows Defender an anti-spyware programme. Vista also included speech recognition, Windows DVD Maker and Photo Gallery, as well as being the first Windows to be distributed on DVD. Later a version of Windows Vista without Windows Media Player was created in response to anti-trust investigations.

Windows 7

Windows 7 was everything Windows Vista should have been.

Considered by many as what Windows Vista should have been, Windows 7 was first released in October 2009. It was intended to fix all the problems and criticism faced by Vista, with slight tweaks to its appearance and a

concentration on user-friendly features and less "dialogue box overload".

It was faster, more stable and easier to use, becoming the operating system most users and business would upgrade to from Windows XP, forgoing Vista entirely.

Handwriting recognition debuted in 7, as did the ability to "snap" windows to the tops or sides of the screen, allowing faster more automatic window resizing.

Windows 7 saw Microsoft hit in Europe with antitrust investigations over the pre-installing of IE, which led to a browser ballot screen being shown to new users allowing them to choose, which browser to install on first boot.

Windows 8

Windows 8 focused more on touch than a keyboard and mouse.

Released in October 2012, Windows 8 was Microsoft's most radical overhaul of the Windows interface, ditching the Start button and Start menu in favour of a more touch-friendly Start screen.

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The new tiled interface saw programme icons and live tiles, which displayed at-a-glance information normally associated with "widgets", replace the lists of programmes and icons. A desktop was still included, which resembled Windows 7.

Windows 8 was faster than previous versions of Windows and included support for the new, much faster USB 3.0 devices.

The Windows Store, which offers universal Windows apps that run in a full-screen mode only, was introduced. Programs could still be installed from third-parties like other iterations of Windows, but they could only access the traditional desktop interface of Windows.

The radical overhaul was not welcomed by many. Microsoft attempted to tread a fine line between touchscreen support and desktop users, but ultimately desktop users wanting to control Windows with a traditional mouse and keyboard and not a touchscreen felt Windows 8 was a step back.

There were also too few touchscreens in use, or on offer, to make its touch-oriented interface useful or even necessary - despite the parallel rise of tablets such as the iPad, and smartphones, which had begun outselling PCs by the end of 2010.

Windows RT, which runs on ARM-based processors traditionally found in smartphones and non-PC tablets, was introduced at the same time as Windows 8 with the Microsoft Surface tablet.

It looked and felt like Windows 8, but could not run traditional Windows applications, instead solely relying on the Windows Store for third-party apps.

Windows 8.1

Windows 8.1 and the great reappearance of the Start button.

A free point release to Windows 8 introduced in October 2013, Windows 8.1 marked a shift towards yearly software updates from Microsoft and included the first step in Microsoft's U-turn around its new visual interface.

Windows 8.1 re-introduced the Start button, which brought up the Start screen from the desktop view of Windows 8.1. Users could also choose to boot directly into the desktop of Windows 8.1, which was more suitable for those using a desktop computer with a mouse and keyboard than the touch-focused Start screen.

Windows 10

With Windows 10, Microsoft is trying to keep some of the touch and tablet features it created for Windows 8, combine them with the familiar Start menu and desktop, and run it all on top of an improved operating system with more security, a new browser, the Cortana assistant, its own version of Office for on-the-go editing and plenty of new features intended to make life simpler.

Of course, that also means it's very different to use, whether you come from Windows 7, Windows 8 or Windows XP. You have to look in a new place even to turn your PC off.

On top of that, Windows 10 is more than just a PC operating system; it's also what will run on Windows phones - and on small tablets as well, because a 6-inch phone and a 7-inch tablet aren't such very different devices.

Microsoft is expecting people to put Windows 10 on a billion devices (which ought to encourage more app developers to at least take a look at building their apps for Windows phones and tablets, as well as for Xbox One and HoloLens).

The Start menu evolves

The full-screen Start screen of Windows 8 is back to being a Start menu in Windows 10 that tries to combine the best of both options. A scrolling Start menu that's restricted to a single column, with jump lists and flyout menus for extra options, divided into frequently used and recently installed programs, with the option to switch to a scrolling view of all the applications, sorted alphabetically.

Fig 1

But also get an extra pane ,where can pin Windows 8-style tiles, complete with 'rotating 3D cube' animations of live tiles. drag the Start menu to be a larger size or even set it to be full screen.

Desktop Background

Another component of the Desktop is the Background. This is simply an image that appears at the back of the screen. Most computers come with a pre-selected background, but change it to any image.

To change the background, follow these steps:

1. Right-click on the background and choose "Personalize"

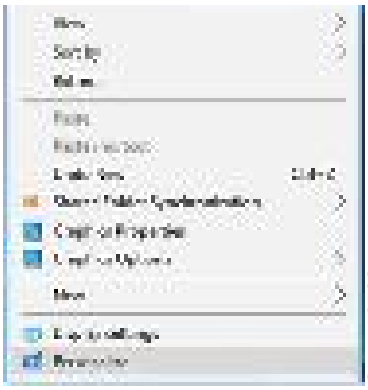
2. From the Personalization window, choose from a series of pre-selected pictures or browse for your own.

After choosing a picture, the Background will change automatically.

Start Menu

If looking for a specific application, open the Start Menu and click "All Applications". This will open an alphabetical

Fig 2



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list of all the applications installed on computer.

Fig 3

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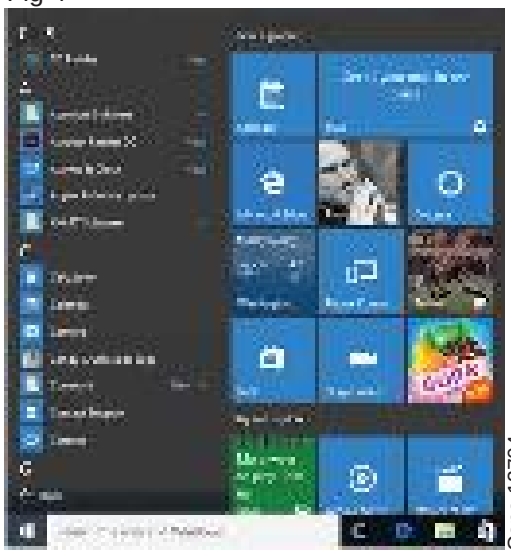
File Explorer

If you are looking for a specific document, another alternative is to use the File Explorer by clicking on the Folder icon on the Taskbar.

In the File Explorer window, browse all the folders and documents.

Fig 4



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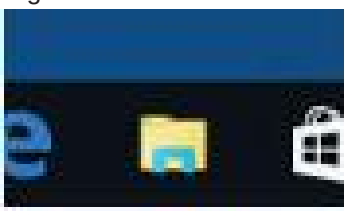
Virtual Desktops

One of the new features of Windows 10 is the addition of Virtual Desktops. This allows you to have multiple desktop screens where to keep open windows organized.

Fig 5



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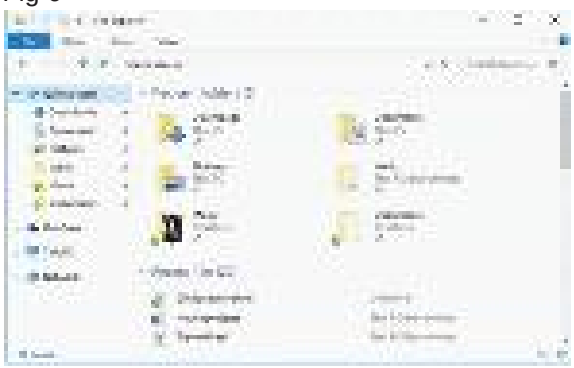
To add a virtual desktop, follow these steps:

Fig 6



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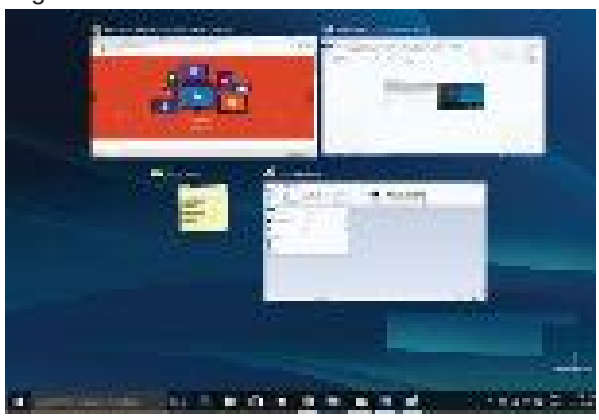
1. Click Task View on the Taskbar

2. Click the "New desktop" option on the lower-right corner. You can access or delete the new Desktop by clicking Task View again.

Cortana helps as with search and control

Cortana, the Windows Phone assistant, shows up in

Fig 7



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Windows 10 as a search pane on the taskbar, which can also trigger by saying 'Hey Cortana' - and when start searching the Start menu.

Fig 8

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That gets theapps have installed, documents access to, apps could install from the Store, search results from the web and a range of other information - including from apps and services that integrate with Cortana.

Activating Cortana

Fig 9

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If Cortana isn't active, can turn it on by typing "Cortana" in the Taskbar search to access the Cortana settings, or just clicking the "Gear" icon on the left-side of the menu.

After activating Cortana, it will start gathering information about to personalize the experience.

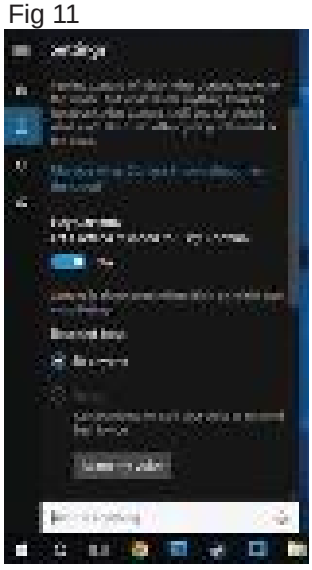
Task switcher

Most Windows users don't know the Alt-Tab keyboard

Fig 10

combination to see and switch between all running apps, so as well as having a redesigned task switcher with bigger

Fig 11



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thumbnails, Windows 10 also puts a task view icon in the taskbar to help them find it.

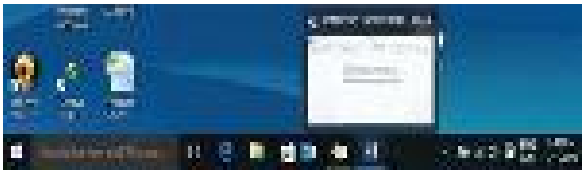
TASKBAR

The Windows 10 taskbar sits at the bottom of the screen giving the user access to the Start Menu, as well as the icons of frequently used applications. On the right-side, the Taskbar features the Notification Area which informs the user of different things like the state of the Internet connection or the charge of the laptop battery.

The icons in the middle of the Taskbar are "pinned" applications, which is a way to have a quick access to

applications you use frequently. "Pinned" applications will stay in the Taskbar until you "unpin" them.

Fig 12



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Pin an Application to the Taskbar

Step 1: Search for the application you want to pin in the Start Menu.

Step 2: Right-click on the application.

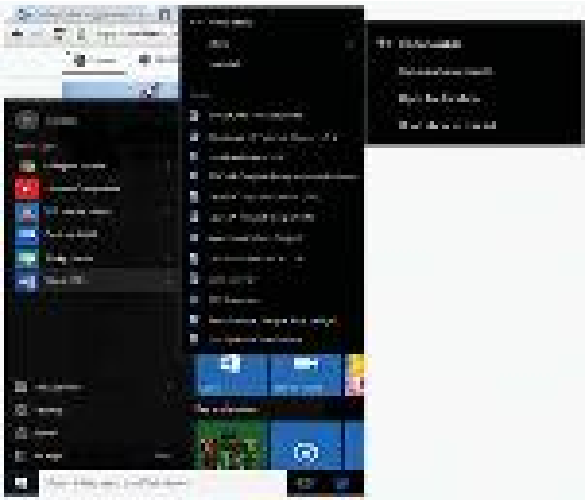
Step 3: Select "More" option at the top of the menu.

Step 4: Select the "Pin to taskbar" option.

Unpin an Application from the Taskbar

To "unpin" it, just right-click the icon in the Taskbar and select "Unpin from taskbar". You can "pin" it back again

Fig 13



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any time you want.

Notification Area

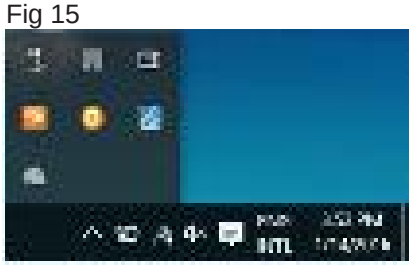
The Notification Area is located at the right side of the Taskbar. It shows different types of notifications from your computer like your Internet connection, or the volume level.

At first, the Notification Area shows a limited amount of icons. But you can click the upward arrow on its left-side to see other icons as well.

Snap Assist

Because all the apps and programs run in windows on the desktop, instead of modern apps from the Store being in their own space, and can no longer drag across the left edge of the screen to bring another app on screen and get a split view. Instead, drag windows into the corners of the screen to get the familiar Snap view.

Fig 15



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Now use all four corners of the screen if want each window to take up a quarter of the screen instead of half, and the space that isn't filled by the window you just dragged shows thumbnails of your other windows to make it easier to snap the next one into place.

Action Center

If we used Windows Phone 8.1 (or Android and/or iOS), we used to a notification centre can drag down from the top of the screen.

Windows 10 puts that on the right of the screen, where the charms bar was in Windows 8, with notifications from various apps at the top and the choice of various settings buttons at the bottom for quick access.

The command prompt

Those of us that use the command prompt have been stuck with pretty much the same experience since the 1990s, but in Windows 10 can finally resize the command prompt window and use familiar keyboard shortcuts to copy and paste at the command prompt.

It's far from ground-breaking but it's a very welcome improvement after years of frustration.

FILE EXPLORER

File Explorer is the file management application used by Windows operating systems to browse folders and files. It provides a graphical interface for the user to navigate and access the files stored in the computer.

The main way to access the File Explorer is by clicking the folder icon in the Taskbar. After clicking the icon, the File Explorer window will open.

Fig 14

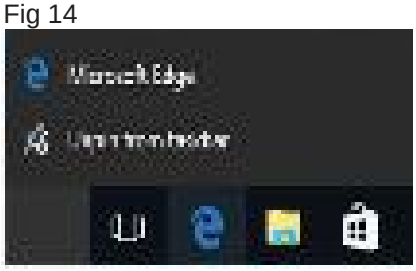

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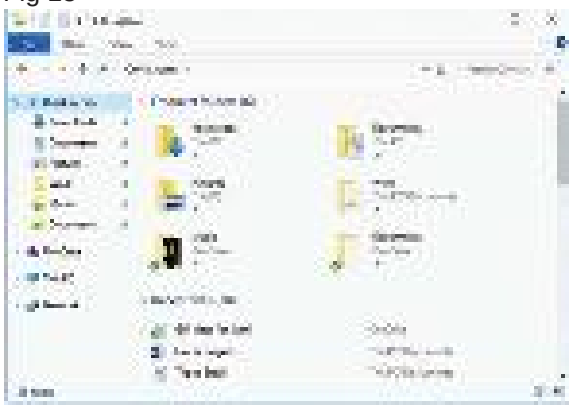
Fig 15



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The initial File Explorer window is comprised of the following sections:

1. The **File Explorer ribbon,** which resembles the ribbon featured in Microsoft Office. The ribbon contains buttons for common tasks to perform with your files and folders.

2. The **Navigation Pane** gives you access to your libraries of documents and pictures, as well as your storage devices. It also features frequently used folders and network devices.

3. The **Frequent folders section** on the right features the folders you've worked with recently to allow for quick access to them.

4. The **Recent files section** in the lower part of the window features files and documents that you've opened recently.

The new Edge browser

To catch up with fast-moving browsers like Chrome and Firefox, Microsoft took its browser back to basics, ripping out years of code that didn't fit with web standards and making a lean, fast browser.

It's a work in progress - it won't get support for things like ad-blocking extensions until a while after Windows 10 launches - but can do plenty of neat things here. For example, and can scribble notes on a web page to send to a friend and Edge has Cortana built in to pull useful information out of web pages, like the phone number of a restaurant, or the opening hours.

Sites like Medium that didn't work properly with IE should look better and have more features in Edge.

Multiple desktops

User need to arrange a lot of windows and don't have multiple monitors, user can put them on multiple virtual desktops. And can use Alt-Tab to move between apps as usual and then Windows-Ctrl and the left and right arrow keys to move between desktops.

Schedule restarts

No more having Windows announce that you have fifteen minutes to get everything done before it restarts to apply an update. Instead of leaving Windows 10 to decide when to do that, if there's an update that will need a restart and can have Windows ask when you want to schedule that for.

user can only do that once the update has been downloaded. If user want to have certain times off-limits for restarts, they will need the features in Windows Update for Business (for Windows 10 Pro and Enterprise) which lets block restarts so they don't happen in working hours, or on certain dates.

Universal apps - including Office

Windows 10 gets a new Windows Store, where download desktop programs as well as modern Windows apps. Many of those apps will be universal apps that are the same code on a PC, a Windows phone, an Xbox One and even on HoloLens, with the interface changing to suit the different screen sizes. The Office for Windows apps like Word and Excel are universal apps, as are the Outlook Mail and Calendar apps.

Settings and control panel

The Windows 8 Settings app has taken over many more of the settings that used to be in Control Panel, and it has a Control Panel-style interface with icons to navigate with. But the old Control Panel interface is still there, for settings that aren't in the new Settings app (or if you're just used to finding things there).

Windows 10 - Keyboard Shortcuts

Like most Windows applications, there are several keyboard shortcuts you can use to make it easier or faster for some to perform certain tasks.

Most of the new Windows shortcuts use the Windows key () combined with other keys to perform several actions. The following are some of the most common or useful shortcuts used in Windows 10.

Keyboard Shortcuts for Navigating Windows 10

Press This	To Do This
Windows Logo	Toggle the Start menu
Windows Logo+A	Open the Notifications pane
Windows Logo+B	Activate the notification area's Show Hidden Icons arrow (press Enter to display the hidden icons)
Windows Logo+C	Open Cortana for voice commands
Windows Logo+D	Minimize all open windows to display the desktop
Windows Logo+E	Run File Explorer
Windows Logo+F	Display the Start menu and activate the Search box
Windows Logo+H	Display the Share pane
Windows Logo+I	Run the Settings app
Windows Logo+K	Display the Devices pane
Windows Logo+L	Lock your computer
Windows Logo+M	Minimize all windows
Windows Logo+O	Turn the tablet orientation lock on and off
Windows Logo+P	Display the Project pane to configure a second display
Windows Logo+Q	Open Cortana for voice commands
Windows Logo+R	Open the Run dialog box
Windows Logo+S	Open Cortana for keyboard commands
Windows Logo+T	Activate the taskbar icons (use the arrow keys to navigate the icons)
Windows Logo+U	Open the Ease of Access Center
Windows Logo+W	Activate the Search box
Windows Logo+X	Display a menu of Windows tools and utilities
Windows Logo+Z	Display an app's commands (although this works in only some Modern apps)
Windows Logo+=	Open Magnifier and zoom in
Windows Logo+-	Zoom out (if already zoomed in using Magnifier)
Windows Logo+,	Temporarily display the desktop
Windows Logo+Enter	Open Narrator
Windows Logo+Left	Snap the current app to the left side of the screen
Windows Logo+Right	Snap the current app to the right side of the screen
Windows Logo+Up	Restore a minimized app; maximize a restored app
Windows Logo+Down	Restore a maximized app; minimize a restored app
Windows Logo+PgUp	Move the current app to the left monitor
Windows Logo+PgDn	Move the current app to the right monitor
Windows Logo+PrtSc	Capture the current screen and save it to the Pictures folder
Windows Logo+Ctrl+D	Create a virtual desktop
Windows Logo+Ctrl+Right	Switch to the next virtual desktop
Windows Logo+Ctrl+Left	Switch to the previous virtual desktop
Windows Logo+Ctrl+F4	Close the current virtual desktop
Windows Logo+Tab	Open Task View, which displays thumbnails for each running app as well as the available virtual desktops

Handling printers

Objectives : At the end of this lesson you shall be able to
- **explain about typewriter**
- **explain about printer**
- **explain types and cost of printers**
- **explain programming languages for printers**
- **explain how to locate printer driver files.**

Typewriter

A typewriter is a mechanical or electromechanical device with keys that, when pressed, cause characters to be printed on a medium, usually paper as on Fig 1. Typically one character is printed per keypress, and the machine prints the characters by making ink impressions of type elements similar to the sorts used in movable type letterpress printing.

Fig 1

After their invention in the 1860s, typewriters quickly became indispensable tools for practically all writing other than personal correspondence. They were widely used by professional writers, in offices, and for business correspondence in private homes. By the end of the 1980s, word processors and personal computers had largely displaced typewriters in most of these uses.

Computer printer

A printer is a piece of hardware for a computer as on Fig 2. It is a device that must be connected to a computer which allows a user to print items on paper, such as letters and pictures. It can also work with digital cameras to print directly without the use of a computer.

Types of printers

Today, the following types of printers are in regular use:

Daisy wheel printing is an impact printing technology invented in 1969 by David S. Lee atDiablo Data Systems as on Fig 3. It uses interchangeable pre-formed type elements, each with typically 96 glyphs, to generate high-quality output comparable to premium typewriters such as theIBM Selectric, but two to three times faster. Daisy wheel printing was used in electronic typewriters, word processors and computers from 1972. According to Webster's, the daisy wheel is so named because of its resemblance to the daisy flower.

Fig 2

Fig 3

Dot-matrix printers are now almost extinct. They used a ribbon and made a lot of noise. There were models with 9 pins and models with 24 pins as on Fig 4. A dot matrix printer or impact matrix printer is a type of computer printer with a print head that runs back and forth, or in an up and down motion, on the page and prints by impact, striking an ink-soaked cloth ribbon against the paper, much like the print mechanism on a typewriter.

Fig 4

Inkjet printing is a type of computer printing that creates a digital image by propelling droplets of ink onto paper as on Fig 5. Inkjet printers are the most commonly used type of printer, and range from small inexpensive consumer models to very large professional machines that can cost tens of thousands of dollars.

Fig 5

The concept of inkjet printing originated in the 20th century, and the technology was first extensively developed in the early 1950s. Starting in the late 1970s inkjet printers that could reproduce digital images generated by computers were developed, mainly by Epson,Hewlett-Packard (HP), and Canon. In the worldwide consumer market, four manufacturers account for the majority of inkjet printer sales: Canon, HP, Epson, and Lexmark, a 1991 spin-off from IBM.

The plotter is a computer printer for printing vector graphics as on Fig 6. In the past, plotters were used in applications such as computer-aided design, though they have generally been replaced with wide-format conventional printers. It is now commonplace to refer to

Fig 6

such wide-format printers as "plotters," even though they technically are not.

Pen plotters print by moving a pen or other instrument across the surface of a piece of paper. This means that plotters are restricted to line art, rather than raster graphics as with other printers. Pen plotters can draw complex line art, including text, but do so slowly because of the mechanical movement of the pens. They are often incapable of efficiently creating a solid region of color, but can hatchan area by drawing a number of close, regular lines.

Laser printing is a digital printing process that rapidly produces high quality text and graphics on plain paper. As with digital photocopiers and multifunction printers (MFPs), laser printers employ a xerographic printing process, but differ from analog photocopiers in that the image is produced by the direct scanning of a laser beam across the printer's photoreceptor.

A laser beam projects an image of the page to be printed onto an electrically charged rotating drum coated with selenium or, more common in modern printers, organic photoconductors. Photoconductivity allows charge to leak away from the areas exposed to light.

Dry ink (toner) particles are then electro statically picked up by the drum's charged areas, which have not been exposed to light. The drum then prints the image onto paper by direct contact and heat, which fuses the ink to the paper.

Cost of printers

There are different costs with a printer. Printers that are more expensive to buy will usually be less expensive in the consumables (the ink, toner, or ribbon used by the printer). Therefore, laser printers are often more expensive to buy than inkjet printers, but are not expensive to use over a long period of time.

Inkjet printers on the other hand have a higher cost of consumables because the ink tanks they use are more expensive than the toner for a laser printer.

Laser printers that can print in color are usually more expensive than those that only print in black and white.

Other options, like being able to print on both sides of a sheet of paper, to automatically sort the output, or to staple the output will also make a printer more expensive.

Common programming languages for printers include:

- ESC/P
- Postscript
- PCL
- GDI
- HPGL and HPGL/2
- PDF
- VPS

How to Locate Printer Driver Files

Printers can be connected to a computer by a variety of wired and wireless methods, but all printers require drivers to be installed on a computer. The printer drivers are small programs that help communicate information from the operating system to the printer.

Driver errors can make the printer unusable. Using the Windows device manager, you can look up details about the drivers as well as pinpoint their physical location on your hard drive.

Scanner

A scanner is an electronic device which can capture images from physical items and convert them into digital formats, which in turn can be stored in a computer, and viewed or modified using software applications.

Different types of scanners are available with different resolutions. In the world of electronic data transmission, scanning is considered to be the most cost-effective and reliable way of transmitting images.

The basic principle of a scanner is to analyze an image and reproduce it to a digital one using the optical character recognition techniques.

Fig 7

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Prominent features of a scanner include:

- Reliability - Unlike certain forms of data transmission, scanning involves only transfer of hard images to digital forms. The role of the end-user is limited in case of scanning. And as they are not dependent on two-way communication, they can also help in storing important information or transmitting important information.
- Efficiency - Modern scanners are built for efficiency and speed. And it comes with ease of use as well as convenience.
- Quality - Scanning ensures the best resolution possible for digital images. Compared to fax machines, which may find it difficult to reproduce the accurate details, scanners can reproduce images with high resolution and precisions. They are quite useful for photography and engineering arenas.
- Cost saving - One of the biggest advantage of scanning is the replacement of physical files/forms with digital ones. Along with saving physical space, which has to be used for storage, there are also environmental benefits by using scanner.