Lab Manual

CSC 302-Applications Of ICT

Department of Computer Science

IMS

List of Labs

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Lab 1 Manual: Basic Computer Components

Objective:

The purpose of this lab is to gain an understanding of the essential components of a computer, both internal and external. This includes identifying various parts and comprehending their primary functions.

Activity Outcomes:

By the end of this lab, you should be able to:

- Recognize the main components of a computer system.
- Understand the functions of input and output devices.
- Identify key internal components and their roles.
- Explain the purpose of internal cards and other crucial elements for computer operations.

1. Useful Concepts

Computers consist of numerous internal and external parts that collaborate to perform various tasks. Below are the key categories and components you will explore:

External Components:

1. **Computer Case** - The enclosure that contains most of the computer's components.
2. **Input Devices**:

- **Mouse**: A pointing device used to navigate the cursor.
- **Keyboard**: A device for entering text and commands.
- **Joystick**: Commonly used for gaming and simulations.
- **Screen**: Touchscreen monitors that function as both input and output devices.

3. **Output Devices**:

- **Screen**: A display device for visual output.

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- **Printer**: Creates physical copies of documents.

Internal Components:

1. **Motherboard** - The primary circuit board that connects all components.
2. **Central Processing Unit (CPU)** - The core of the computer that processes instructions.
3. **Random Access Memory (RAM)** - Temporary storage for data and programs currently in use.
4. **Storage Devices**:

- **HDD (Hard Disk Drive)**
- **SSD (Solid State Drive)**
- **SSHD (Solid State Hybrid Drive)**

5. **Power Supply Unit (PSU)** - Converts electrical power to the appropriate voltage for the computer components.

2. Key Internal Components and Their Functions

1. **Video Card (GPU)** - Handles rendering images and videos for display.
2. **Network Card** - Facilitates the computer's connection to a network (wired or wireless).
3. **Bluetooth Card** - Enables wireless communication with Bluetooth devices.
4. **Cooling Systems**:

- **Cooling Fan**: Helps maintain a cool temperature for the components.
- **Heatsink**: Dissipates heat from critical components such as the CPU.

5. **BIOS (Firmware)** - Basic software that initializes and manages communication between hardware components during startup.

For more detailed information on internal components, refer to the online

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resource: Internal Components Overview【8†source】.

3. Lab Tasks and Activities

The instructor may assign tasks that involve identifying or disassembling components, understanding connections, or testing the functionality of various parts. Always follow safety protocols when handling internal components, especially electrical ones.

Lab Task 1: Understanding the Computer Case

- Examine the placement and connections of internal components within the case.
- Identify the input/output ports and explain their purposes.

Lab Task 2: Component Identification

- Utilize the provided list to identify each component.
- Document their functions and significance in a computer system.

Lab Task 3: Disassembly and Assembly

- Carefully disassemble a computer under supervision, noting the arrangement of each part.
- Reassemble the computer and verify its functionality.

Lab Task 4: Internal Card Functions

- Explain the roles of additional cards such as the network card and Bluetooth card.
- Observe how the cooling system (fan and heatsink) regulates temperature.

Instructor Note:
Review Chapter 1 of the textbook "Introduction to Information & Communication Technology" for a deeper understanding of the components discussed in this lab.

4. Conclusion

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By completing this lab, students will acquire a foundational knowledge of computer components, how information is processed, and how each part contributes to the overall functionality of the system.

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Lab 2 Manual: Operating Systems

Objective: The purpose of this lab is to grasp the essential functions of operating systems (OS) in overseeing hardware and software resources. You will also investigate the distinctions between operating systems and BIOS, the installation procedures, and fundamental configuration steps.

Activity Outcomes:

By the conclusion of this lab, you should be able to:

- Comprehend the primary functions of an operating system.
- Distinguish between BIOS and an OS.
- Familiarize yourself with various types of operating systems.
- Install, configure, and perform basic maintenance tasks on an OS.

1. Key Concepts

An **Operating System (OS)** is the main software that manages all hardware and software on a computer. It offers a user interface, oversees hardware resources, and facilitates the execution of applications.

Key Comparisons:

1. **BIOS (Basic Input/Output System)**:

- Firmware that manages the initial setup of hardware.
- Responsible for the boot process before the OS takes over.
- Operates at a low level to control data flow between the OS and connected devices.

2. **Operating System (OS)**:

- Software that assumes control after the BIOS completes its tasks.
- Manages hardware, provides a user interface, and runs applications.

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Popular Operating Systems:

1. **Windows**:

- Developed by Microsoft (Bill Gates).
- Closed-source; the source code is not publicly available.

2. **Mac OS**:

- Developed by Apple (Steve Jobs).
- Also closed-source.

3. **Linux OS**:

- Created by Linus Torvalds in 1991.
- Open-source, with various distributions such as Ubuntu, Kali Linux, Arch, and Mint.

2. Operating System Installation

Here are the steps for installing different operating systems:

Windows Installation:

1. **Initial Setup**:

- Power on the computer and initiate the installation process.
- Enter the product key.
- Accept the license agreement.
- Select the installation type (Upgrade or Custom).
- Partition the hard drive and start the installation.

Watch a tutorial on Windows 10 Installation.

2. **First-Time Setup**:

- Configure region, language, and keyboard layout.
- Connect to a network.

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- Set up or skip a Microsoft account.
- Review privacy settings.
- Update the system if necessary.

Mac OS Installation:

- Detailed installation steps can be found here.

Linux Installation:

1. **Ubuntu Installation**:

- A user-friendly Linux distribution.
- Watch a tutorial for Ubuntu Installation.

2. **Kali Linux Installation**:

- A specialized Linux distribution for penetration testing.
- Watch a tutorial for Kali Linux Installation.

3. Basic Configuration and Setup

After installing the OS, follow these configuration steps:

Windows Basic Configuration:

1. **Desktop Customization** - Personalize wallpaper, themes, and icons.
2. **System Settings** - Adjust display settings, power management, and device preferences.
3. **User Accounts** - Create and manage user profiles.
4. **Security Settings** - Configure Windows Defender, firewalls, and antivirus software.
5. **Backup and Software Installation** - Utilize built-in tools for data backup and install essential applications.
6. **Accessibility Features** - Set up accessibility options for visual and auditory needs.

Maintenance and Updates:

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- Regularly check for system updates.
- Use tools like Disk Cleanup and Defragmenter to maintain system performance.
- Monitor system performance with built-in tools.

4. Control Panel and Management Tools

Key Components in Windows:

- **Control Panel** - Access system settings.
- **User Accounts** - Manage different profiles and permissions.
- **Computer Management** - Handle tasks such as disk management and services.
- **Device Manager** - Manage hardware devices and drivers.
- **Hostname** - Change and identify the computer's name within a network.

For a comparison of CPU and GPU roles in computing, you can view this video.

5. Conclusion

By the end of this lab, students will have a comprehensive understanding of operating systems, including how to install and configure them, as well as the differences among various OS types. This knowledge is essential for effectively managing and troubleshooting any computer system.

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Lab 3 Manual: Command-Line Interface (CMD)

Objective: This lab aims to provide practical experience with the Command-Line Interface (CLI), focusing on the Command Prompt (CMD) in Windows. You will learn how to navigate through directories, manage files, and execute basic system tasks using text commands.

Activity Outcomes:

By the conclusion of this lab, you should be able to:

- Distinguish between Command-Line Interface (CLI) and Graphical User Interface (GUI).
- Access and utilize CMD efficiently.
- Navigate directories using fundamental commands.
- Create, move, copy, and delete files and directories.
- Control screen output in CMD.

1. Important Concepts

CLI vs GUI:

- **Graphical User Interface (GUI)**:
- Utilizes visual components such as windows, icons, and menus.
- More intuitive; suitable for beginners.
- **Command-Line Interface (CLI)**:
- Operates through text-based commands.
- Provides enhanced control and flexibility.
- Favored by advanced users and developers.

The choice between GUI and CLI often hinges on user familiarity and specific task needs.

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Command Prompt (CMD):

CMD is a command-line interpreter found in most Windows operating systems, allowing users to communicate with the OS through typed commands.

How to Access CMD:

1. Enter **cmd** in the Start menu search bar.
2. Press **Shift + F10** and select "Open in Terminal."
3. Use **Windows Key + R**, type **cmd**, and hit **Enter**.

2. Core Concepts: Files and Directories

- **Files**:
- Data collections stored on a computer (documents, images, audio files, etc.).
- Each file has a distinct name and is located in a specific directory.
- **Directories (Folders)**:
- Virtual containers that organize files in a hierarchical manner.
- Can include other directories (subdirectories) for improved organization.

Grasping these concepts is essential for effective system management using CMD.

3. Fundamental CMD Commands

Navigating Directories:

1. **dir** - Displays the contents of the current directory.

- **dir /p** - Shows directory contents one page at a time.

2. **cd** - Changes the current directory.

- **cd ..** - Moves up one level in the directory hierarchy.
- **cd ../..** - Moves up two levels.

Managing Files and Folders:

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1. **Create a Directory**:

- **mkdir <directory_name>** - Creates a new directory.

2. **Remove a Directory**:

- **rmdir <directory_name>** - Deletes a directory.
- **rmdir /s <directory_name>** - Deletes a directory and all its contents.

3. **Copy and Move Files**:

- **copy <source> <destination>** - Copies files from the source to the destination.
- **move <source> <destination>** - Moves files from the source to the destination.

4. **Delete Files**:

- **del <file_name>** - Deletes a specified file.

Additional Commands:

- **cls** - Clears the CMD screen.
- **exit** - Closes the CMD window.
- **echo "Content" > file.txt** - Creates a file with the specified content.

4. Lab Tasks and Activities

Below are some exercises to help you become comfortable with CMD:

Task 1: Directory Navigation

1. Use **dir** to view the contents of your current directory.
2. Navigate to a specific folder using **cd <folder_name>**.
3. Use **cd ..** to return to the previous directory.

Task 2: File and Folder Management

1. Create a new directory using **mkdir**.
2. Create a text file within the new directory using **echo**.

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3. Move the text file to another directory using **move**.
4. Copy the file back to the original directory using **copy**.

Task 3: File Deletion and Directory Cleanup

1. Delete the copied file using **del**.
2. Remove the entire directory along with its contents using **rmdir /s**.

5. Conclusion

Completing this lab will help students become familiar with the command line, a vital skill for advanced system management and automation. Proficiency in CMD commands can greatly enhance efficiency in handling system tasks.

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Lab 4 Manual: Command Line Navigation

Objective:

This lab aims to build foundational skills in using the Command Prompt (CMD) for navigating the file system, managing files and directories, and creating basic scripts for automation. By learning these command-line tools, students will develop a versatile skill set useful in system administration, troubleshooting, and workflow automation.

Activity Outcomes:

After completing this lab, students should be able to:

1. Understand the difference between absolute and relative paths.
2. Navigate directories and manage files using command-line commands.
3. Create, modify, and execute a batch script to automate tasks.
4. Comprehend the structure and applications of batch scripting for repetitive tasks.

1. Introduction to Command Line Basics

Overview

The command line is a text-based interface that allows users to interact with the operating system through typed commands. Unlike graphical user interfaces (GUIs), the command line provides a more direct and efficient way to perform tasks, especially for managing files and executing scripts.

Basic CMD Syntax

In CMD, commands follow a general syntax:

- **command [options] [arguments]**

For example:

```shell
cd Documents
```

Copy code

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2. Core Concepts

2.1 Absolute Path

An **absolute path** provides the complete location of a file or directory from the root directory. This path starts with the drive letter and is essential for referencing files regardless of the current working directory.

- **Example**: **C:\Users\John\Documents\Report.docx**

2.2 Relative Path

A **relative path** describes a file or folder location from the current directory rather than the root. It's often shorter and efficient for navigating directories without typing the full path.

- **Example**: If the current directory is **C:\Users\John**, the path to **Documents** is simply **Documents**.

3. Basic Navigation and File Management Commands

3.1 Navigation Commands

- **cd (Change Directory)**: Moves between directories.
- Example: **cd Documents** changes to the **Documents** directory.
- **cd ..** moves up one directory level.
- **cd ** returns to the root directory.
- **dir (Directory)**: Lists files and folders in the current directory.
- Example: **dir** displays all contents of the current directory.
- **dir /p** displays the contents one page at a time.

3.2 File Management Commands

- **copy**: Copies files from one location to another.
- Example: **copy C:\Reports\file1.txt D:\Backup\file1.txt**

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- **move**: Moves files to a new location.
- Example: **move file1.txt D:\Backup**
- **del**: Deletes a file or multiple files.
- Example: **del file1.txt** deletes **file1.txt** from the current directory.
- **mkdir (Make Directory)**: Creates a new directory.
- Example: **mkdir NewFolder** creates a directory called **NewFolder**.
- **rmdir (Remove Directory)**: Deletes a directory.
- Example: **rmdir NewFolder** removes the **NewFolder** directory if it's empty.

4. Batch Scripting Basics

4.1 What is a Batch Script?

A **batch script** is a text file containing a series of command-line commands that execute sequentially. Batch files are typically saved with a **.bat** extension. Batch scripts are ideal for automating repetitive tasks, like file organization, system maintenance, and backup processes.

4.2 Creating a Batch Script

1. **Open Notepad**: Write the commands you want to execute, one per line.
2. **Save the File**: Name the file with a **.bat** extension (e.g., **automation.bat**).
3. **Execute the Script**: Open CMD, navigate to the script's location, and run the script by typing its name, e.g., **automation.bat**.

4.3 Example Script for Folder Creation and File Movement

Below is an example of a batch script that automates folder creation, moves files, and displays a success message.

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```batch
@echo off
echo Creating Backup Folder...
mkdir D:\Backup

echo Moving Files to Backup...
move "C:\Users\John\Documents\file1.txt" "D:\Backup"

echo File moved successfully!
pause
```

In this script:

- **@echo off** suppresses command output to make the script cleaner.
- **echo** is used to display messages.
- **pause** pauses the execution so the user can see the final message.

5. Lab Tasks and Activities

Task 1: Exploring Directories with CMD

1. Open the Command Prompt.
2. Use the **cd** command to navigate to the **C:\Users** directory.
3. List the contents of this directory using the **dir** command.
4. Navigate to the **Documents** folder and list its contents.
5. Practice using relative paths by moving up one level with **cd ..**.

Task 2: File Management in CMD

1. Create a new folder called **TestFolder** in the **Documents** directory using the **mkdir** command.
2. Inside **TestFolder**, create a text file by typing **echo Hello World > example.txt**.
3. Copy **example.txt** to the **Desktop** using the **copy** command.

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4. Move **example.txt** from the **Desktop** to **Documents** using the **move** command.
5. Delete **example.txt** from **Documents** using the **del** command.

Task 3: Writing a Simple Batch Script

1. Open Notepad and enter commands to:

- Create a folder called **Reports**.
- Move any **.txt** file from **Documents** to **Reports**.
- Display a success message after moving the file.

2. Save the script as **organize.bat** and run it from CMD.
3. Observe how the batch script automates the tasks and displays messages.

Task 4: Advanced Scripting with Loops and Conditions

1. Write a batch script that:

- Checks if **Reports** exists; if not, it creates it.
- Moves **.txt** files only if they exist; otherwise, displays a message stating no files were found.

Example script for this task:

batch Copy code

```
@echo off
if not exist "D:\Reports" (
   mkdir D:\Reports
)

if exist "C:\Users\John\Documents\*.txt" (
   move "C:\Users\John\Documents\*.txt" "D:\Reports"
   echo Files moved successfully!
) else (
   echo No .txt files found in Documents.
)
pause
```


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6. Conclusion

Through this lab, students have developed skills in navigating and managing the file system using the command line. They have also created and executed batch scripts, reinforcing the power of automation in command-line environments. Mastering these basics sets a foundation for more advanced scripting and system administration tasks.

Additional Resources

- Batch Scripting Tutorials
- Command Line Navigation Guide

This hands-on lab prepares students with essential skills for working efficiently in a command-line environment, essential for roles in IT and system management.

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Lab 05 – 06 Manual: Introduction to MS Word

This lab will provide a hands-on experience of MS Word. Word is used for documentation. MS word is helpful in creating official documents, letters, and other similar materials.

Activity Outcomes:

The lab will teach students to prepare different text documents. The students will be able to:

- Create a formal text document with different formatting
- Use different merging tools
- Inserting tables and images in text documents.

Instructor Note:

As a lab activity, read "Microsoft" official site for guidelines uploaded in google classroom.

1) Useful concepts:

Microsoft Word is a very helpful tool to create a wide variety of professional documents quickly and easily. This combination of ease of use and robust features makes it the go-to word processor in both homes and offices today. It's now also available for the Mac operating system as well as a web-based version through an Office 365 subscription.
You can also find templates to help you create the following:

- letter
- report or paper
- proposal
- newsletter
- brochure

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- catalog
- poster
- flyer
- postcard
- sign
- banner
- resume
- business card
- invoice
- receipt
- product packaging
- mailing label

2) Solved Lab Activities

Sr.No	*Level of Complexity*	*CLO Mapping*
1	*Low*	*CLO-2*
2	*Low*	*CLO-2*
3	*Low*	*CLO-2*

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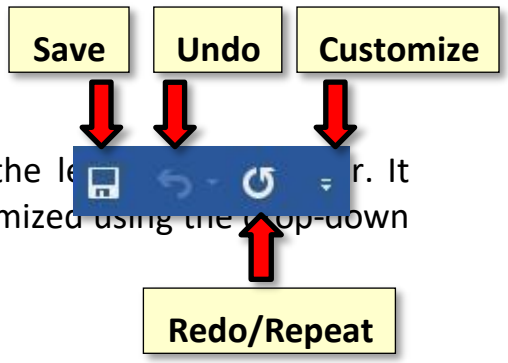
Activity 1:

Exploring MS Word document

Solution:

Title Bar

1. **Note** the title bar section which has **window controls** at the right end, as in other Windows programs.
2. **Note** that a blank document opens with a default file name of **Document 1**.



3. ***Quick Access Toolbar***
   The Quick Access Toolbar is located all the way to the le r. It contains frequently used commands and can be customized using the p op-down menu.
1. **Point** to each small icon to view its ScreenTip.
2. **Be aware** that the **Undo** button is not located anywhere else in the application except for the Quick Access Toolbar.
3. **Click** the **Customize Quick Access Toolbar** button, **click New** o **see** the command get added to the QuickAccess Toolbar.

4. **Click** the **Customize Quick Access Toolbar** button again, and **click** ***Show Below the Ribbon. Click Show Above the Ribbon*** *to move the Quick Access Toolbar back again.*

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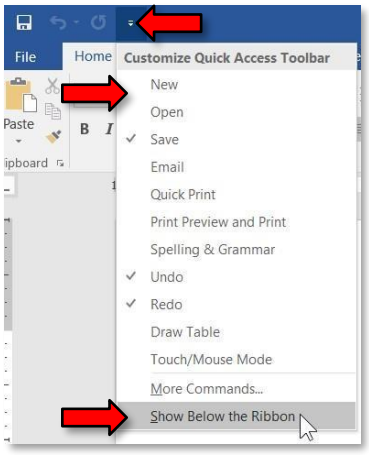

Ribbon

The ribbon contains all of the tools that you use to interact with your Microsoft Word file. It is located towards the top of the window underneath the title bar. All of the programs in the Microsoft Office suite haveone.

The ribbon has a number of **tabs**, each of which contains **buttons**, which are organized into **groups**. Depending on the object you have selected in the document, several **contextual tabs** may appear, which provide additional formatting options for the selected object.

Try **clicking** on other **tabs** to view their buttons (do not click th

and then **return** to Home tab.

Active Tab

By default, Word will open with the **Home tab** active on the ribbon. **Note** how

the Active tab has a white background and blue letters, and the Inactive tabs have the opposite.

Contextual Tab

Contextual tabs are displayed when certain objects, such as an images and text boxes, are selected. They contain additional options for modifying the object. Contextual tabs stand out because they are darker in color and are located to the right of all the other tabs. As soon as we start being productive in the program, wewill see contextual tabs appear.

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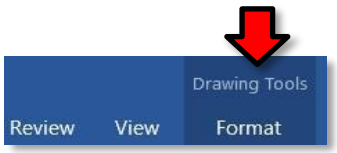

Groups and Buttons

On each **Tab**, the **Buttons** (a.k.a. commands or tools) are organized into **Groups**. The groups have names,but the names are not clickable.

Hover over some of the buttons on the Home tab to **observe** the **ScreenTips**.

The ScreenTip displays the name of the button, along with a short description of what the button does.

Buttons with Arrows

Note that some buttons have images on them and some have images *and an arrow*. The arrow indicates that more information is needed to carry out the function of the button. Some arrowed buttons have two parts: the button proper and the list arrow.

- A **one-part arrowed button**, called a **menu button**, will darken completely when you point to it:

1. In the **Font group**, **point** to the **Text Effects and Typography** button.

2. **Note** there is no difference in shading between the left and right of the button when you point to each section.

- On a **two-part arrowed button**, called a **split button**, only one section at a time will darken whenyou point to it.

1. In the **Paragraph group**, **point** to the left part of the **Shading** button. This is th

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"**button proper**" section of the button. **Note** how it is darkened separately from the arrow portion of the button.

2. **Point** to the **right portion**, the section with the arrow. This is the "**list arrow**" section

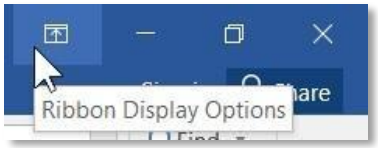
of the button. **Note** how it is darkened separately from the left portion.
3. The **button proper** is the section of a two-part button that will carry out the default option or the last used option.
4. The **list arrow** section will open an options menu.

Dialogue Box Launcher

On some groups there is a **launcher** icon which will open a **dialogue box** or a **side panel** with related butless common commands.

Click any Dialogue Box Launcher icon, and then **close** the dialogue box or side panel.

Ribbon Display Options button
This button provides options that will hide the Ribbon from view. The main benefit to this is that it allowsyour document to take up more of the screen.

1. **Locate** the **Ribbon Display Options** button (to the left of the window control


buttons).

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2. **Click** on it. Three options appear.

3. **Click Auto-hide Ribbon**. This option essentially makes Word go into "full screen" mode. It hides not
only the ribbon, but also the Quick Access Toolbar, title bar, and Window Controls.

4. To get the ribbon to **show** after Auto-hiding it:

a. **Point** to the **top-center** of the screen and **click**. (Clicking the three dots does the same thing.) The full ribbon can be seen and used. However, as as soon as the body of the document is clicked it will hide again.

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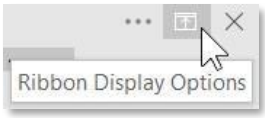
b. **Click** in the middle of the document. **Notice** how the ribbon **hides** again.

5. To get a partial display of the ribbon to stay in view:

a. **Click** the "mini" **Ribbon Display Options** button on the top right.



b. **Click Show Tabs**. **Note** this option has brought back our Quick Access Toolbar, title bar, Window Controls, and *part* of the ribbon; only the **Tabs** are visible. The buttons are not.

c. **Click** the **Home** tab. **Notice** how the buttons come into view.

d. **Click** in the middle of the document. **Notice** how the buttons disappear again.

> **Note:** A shortcut for changing to the "Show Tabs" view is to **double-click** the Active Tab. If the buttons in the ribbon suddenly disappear, then you may have done this by accident.

To get the entire ribbon to stay in view:

Click Ribbon Display Options

b. **Click Show Tabs and Commands**. This option keeps **entire** ribbon visible at all times. It is the **default** option. We will keep this option selected for the remainder of class.

Dynamic Resizing

If you use Word on other computers, be aware that the button placement on the ribbon might look **slightly different**. For instance, a button might be a different

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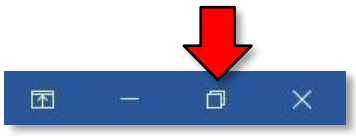
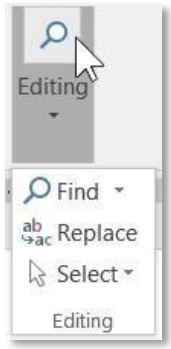
size or be positioned in a slightly different place. The reason for this is that the ribbon auto-adjusts itself based on the size of the Word window.

1. On the **Home** tab **notice** what the buttons in the **Editing** group currently look like.

2. **Click Restore Down** to shrink the size of the Word window.



3. **Notice** how the group looks different now. The entire group was collapsed into a **single button**. Click on the button to reveal the contents of the group.



4. **Click Maximize** to bring the window back to full screen.

File Tab

The **File** tab provides a **Backstage** view of your document. The Backstage view exposes information and metadata about the currently active document, lists recently opened documents, and provides a variety of user options, such as opening, saving, and printing. Instead of just a menu, it is a full-page view, which makes it easier to work with.

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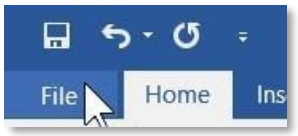
1. **Click** on the **File** tab.



2. **Notice** that the ribbon and the document are no longer in view. **Note** the commands, listed on the left side of the screen, are ones you would use to perform actions **TO** a document rather than **IN** a document.
3. Other things you can do in the **Backstage** view:

a. **Click** the **Info** tab. The **Info** section of the **Backstage** view offers an easy to use interface forinspecting documents for hidden properties or personal information.

b. **Click** the **New** tab. In this section you can create a new Blank document, or choose from a largeselection of Templates.

c. **Click** the **Open** tab. The **Open** section is used to open existing files on your computer.

i. It immediately presents you with a list of documents that you have **recently** opened, so you can quickly find and open them again. (This is disabled in the computer lab.)

ii. Clicking **Browse** opens a **File Explorer** dialogue, which allows you to find the file onyour computer. We will be using this option in class.

d. **Click** the **Save As** tab. This section allows you to save your file.

4. To return to the document from the Backstage view, **click** the large, left pointing arrow in the top-left corner of the screen.

`

Workspace

Underneath the ribbon is the workspace.

1. **Note** the **rulers** and **margin** settings.
2. **Note** the **scroll bar** on the right side of the screen.

a. If the scroll bar is not visible, **move** the mouse and it will come into view.

3. **Note** the **blinking cursor/insertion point,** which is where **new input will display** when entered.

a. If the insertion point is not blinking, **move** the mouse and it will start blinking.

4. **Point** somewhere on the blank page and **note** the mouse cursor with the **I-beam shape**, appropriate fora text environment.

Status Bar

The Status bar is located below the document window area.

Current Information

The **left end** displays a variety of information about the document, such as the page number, how many total words are in the document, and whether there are any spelling errors.

Views

At the **right end** are shortcuts to the different **views** that are available. Each view displays the document ina different way, allowing you to carry out vario

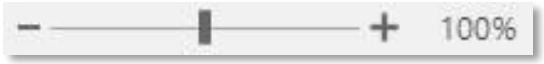
Read Mode Displays the document full-screen, making it easier to read. You cannot edit the document in this view.

Print Layout Shows what the document looks like when it's printed. This is overall the best view for editing documents. It is selected by default.

Web Layout Shows what the document would look like if it were saved as a webpage.

Zoom Slider

Also at the **right end** of th adjust how large the docum



`

actual size of the document—just how big or small it is displayed on the screen (like moving a newspaper away from or closer to your eyes).

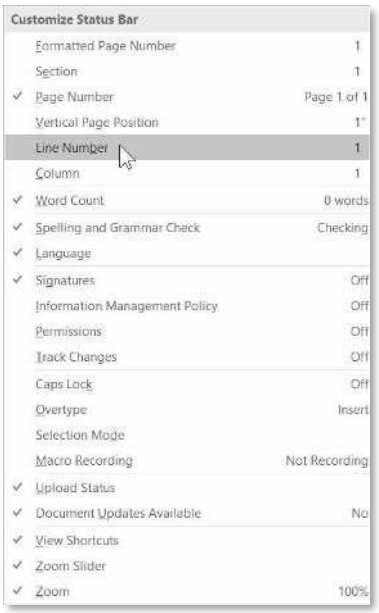
Customization

The **Status** bar can be customized.

1. **Right-click** on the **Status** bar to bring up the customize menu. Options that are enabled havea checkmark next to them.
2. **Click** on “Line Number” to enable this option.

`

3. **Notice** how the menu didn't disappear. **Click** in a clear space to dismiss the menu.
4. **Notice** how "Line: 1" appears in the **Status** bar.



Creating a document

1. When Word opens, it will display a blank document ready for you to type in. The words that you type and the formatting that you use become your document.
2. **Type** "My first document".
3. Each document you create is temporary unless you save it as a **file** with a unique name andlocation.

Preparing a Save to Location – a USB Device

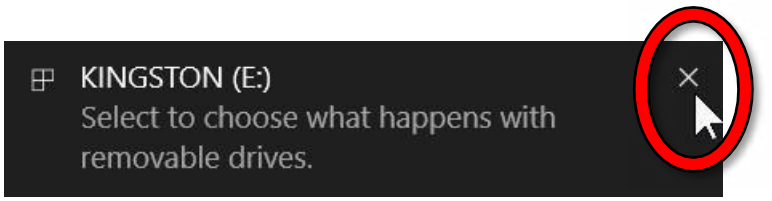
> **Note:** Home students can skip this section.

When we save a Word document, all the data in that document is collected and saved as a **file**. Normally files are saved on a computer's hard drive, but due to security restrictions on computer lab machines, files must be saved on removable storage devices.

2. **Fit** the connector into the port and **push** it in gently.
3. At this point, you ***may*** get a notice that the computer is installing a device driver – **wait** until the

message disappears.

4. A notification may appear in the bottom-right corner of the screen, asking what you want to do with the flash drive. **Close** it by **pointing** to it and clicking its **Close** button.



You are now ready to begin saving your file.

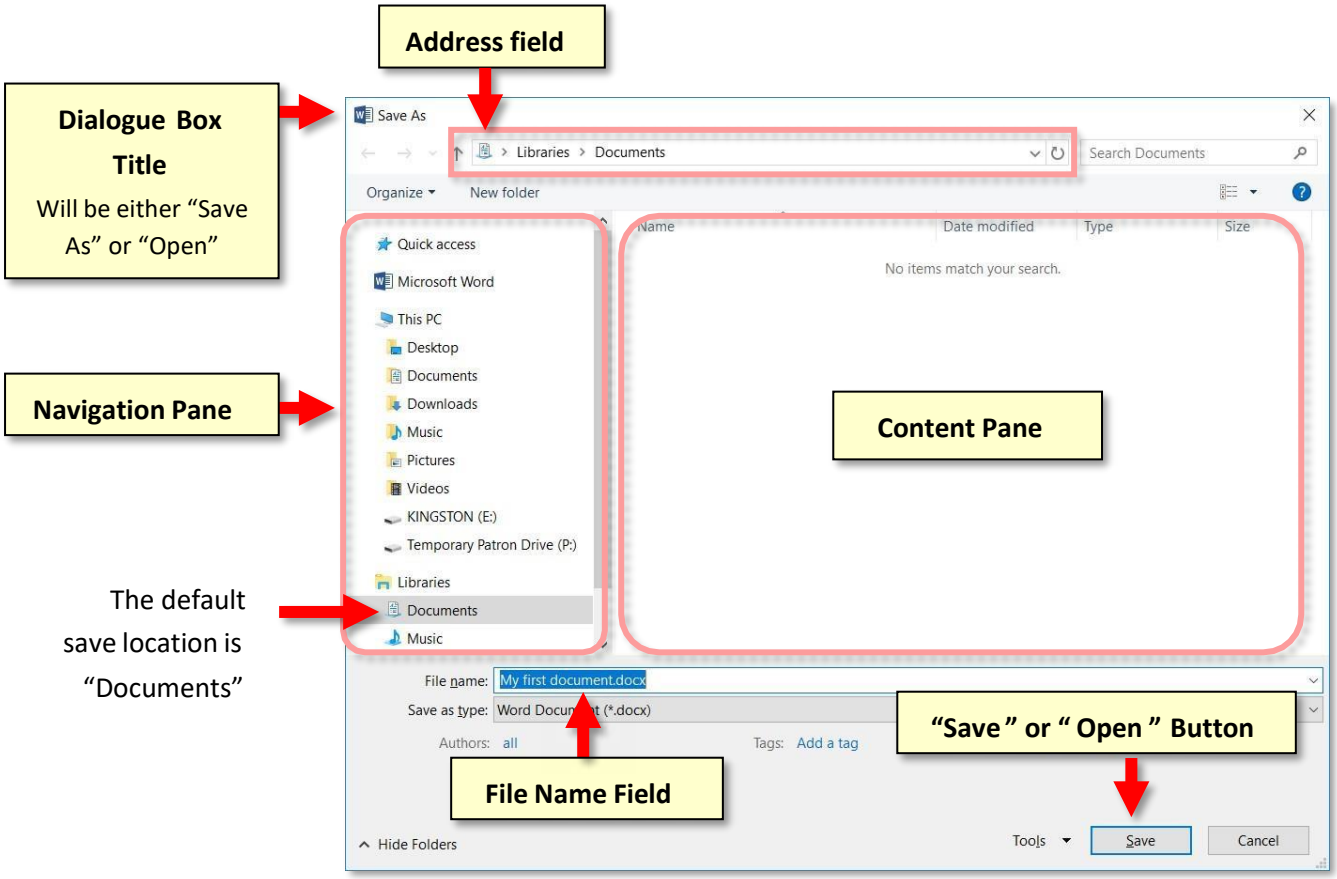
Saving the File

1. **Click** the **File** tab.
2. **Click Save As**. We use "Save As" instead of "Save" the **first** time we save a file because we need to tell the computer *where* to *put* the file (the file doesn't have a "home" yet).

"Save" assumes you've saved it before.

3. **Click Browse**.

4. **Notice** that a smaller window appears in front of our work. This small window is called a **dialogue box**. Because the computer needs to know more than just



"OK, save," the dialogue box is where we tell it *how* we want to save our work.

5. When it comes to saving, there are two important things to *identify* for the computer:

1. The **location** where the file is going to be saved to.
2. What **name** you want to give the file.

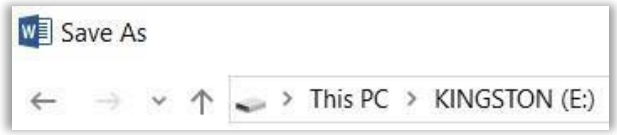
6. The **location** where it will be saved is displayed for us in the **Address field**. In this case, **note** that the **Documents directory** is the **default** save location, but we want to save our file to the **flash drive**.

7. **Notice** other available folders and devices can be seen in the left pane, called the **Navigation pane**. If we wanted to save to one of these alternate locations, we would have to click on it.

8. **Find** the location labeled **KINGSTON (E:)** and **click** it. Kingston is the name of the company that created our flash drive.

   Note: If you are taking this class from home and do not have a flash drive, use "Documents" as the location to save your files.

9. Your address field should now read **This PC > KINGSTON (E:)**.



10. Now we need to name our file. **Notice** that the file name field is towards the bottom of the dialogue box. By default, Word names the file after the first few words that were typed into the document.

11. **Click** into this box and the words will be highlighted. Then **type** the word **first** to name yourfile
'first'.

12. Once we have given the computer **a file name** and a **save location**, we are ready to save. At this point, your Save As dialogue box should look like the

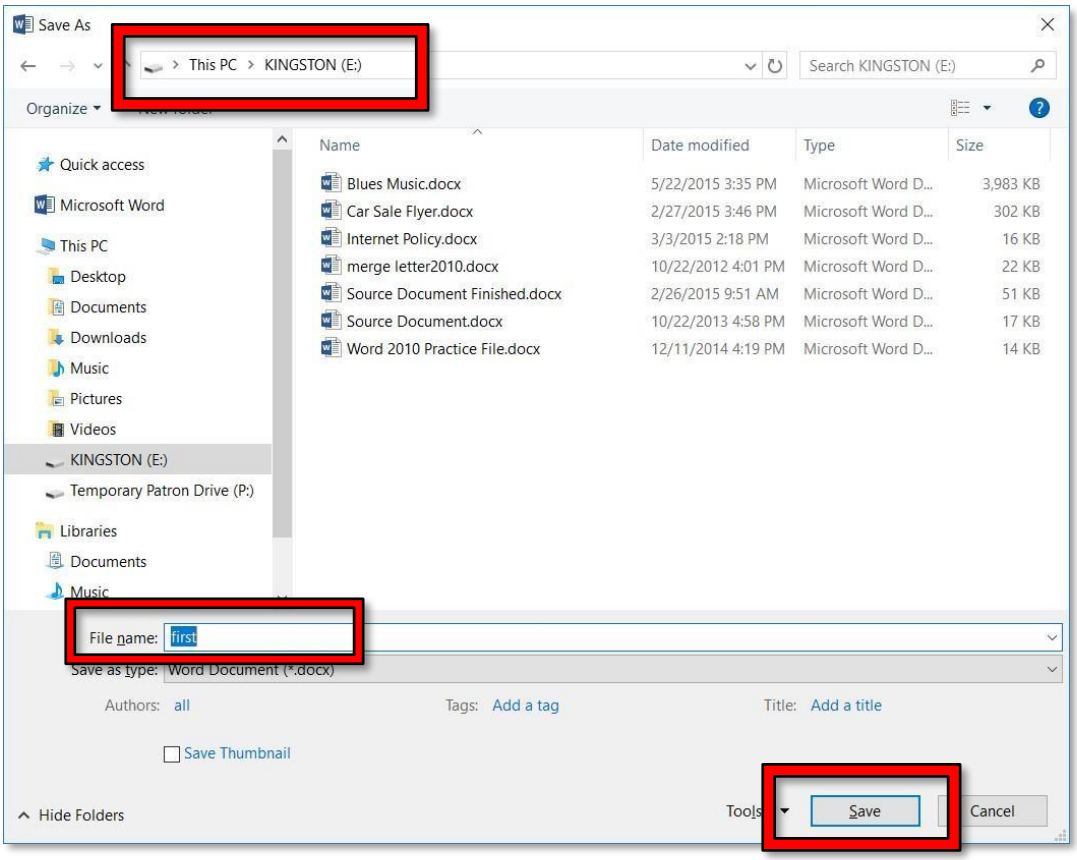


image below. To save, you will **click Save**.

13. Your Word window will still be open but **notice** the **title** bar will now show the file name
first.docx.

Activity 2:

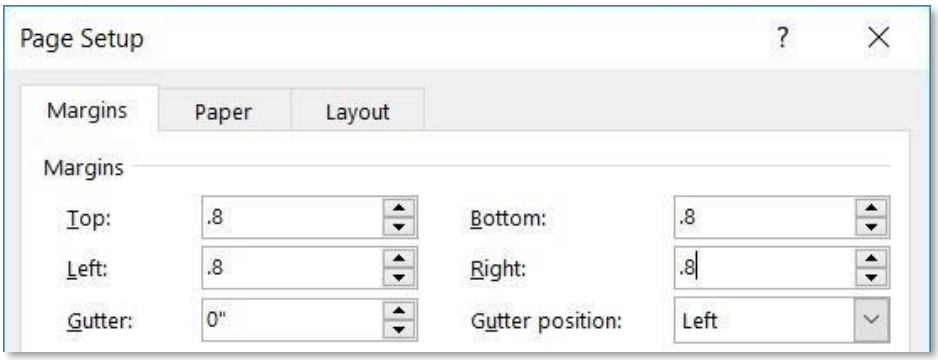
Controlling the Appearance of your Document

Solution:

Changing Page Margins

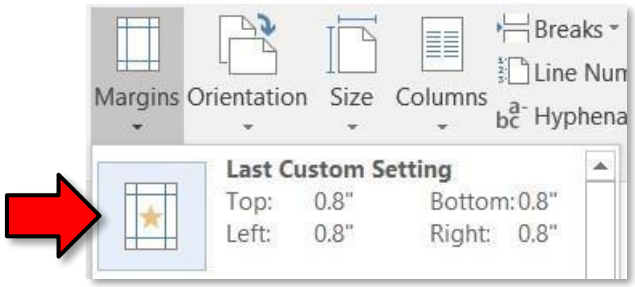
1. **Click** the **Layout** tab to access tools to change the appearance of your document.
2. In the **Page Setup** group**, click Margins**. A list will appear that will have your current settings highlighted. **Click Wide** to *see* how it will affect your document.
3. **Click Margins** again and **click Custom Margins** at the bottom of the list**.**

When the **Page Setup dialogue box** opens, on the **Margins** tab, in the **Margins**
section **click** the arrows to **change** the top, left, bottom and right margins to **0.8”**.



b. The **Gutter** setting is an extra margin that is only used if you want to **bind** your printed pages together in some way (such as with a three-hole-punch). **Leave** this at **0”**. c. **Click OK**.

4. In the **Page Setup** group, **click Margins** again and **notice** how the margin list



has nowpopulated with your customization.

Page Breaks

1. **Place** your insertion point at the end of the blue paragraph.
2. On the **Insert** tab, **find** the **Pages** group and **click Page Break**.
3. **Notice** how the lines below are now on the next page.
4. **Notice** how Word has inserted some blank space at the top of the next page.
5. **Tap** the Delete **key** to remove this extra space.

Good stopping point for Session 1.
Close "Internet Policy.docx" and **save the changes**.

Describe how the Exercise is organized: The parts in parentheses are **hints** concerning how to complete each step.

Headers and Footers

A **header** is text that appears at the **top** of every page in your document. Similarly, a **footer** is textthat appears at the **bottom** of every page.

1. First, let's insert a **header**.

a. **Open** Internet Policy.docx.

b. **Tap** Ctrl + Home to get to the top of the document.

c. **Click** the **Insert** tab. In the **Header & Footer** group, **click Header** to open a list of different header options.

d. Scroll down the menu to view all the options and **click Blank.**

e. **Notice** that a new **contextual ribbon** has opened called **Header & Footer Tools.** It hasone tab - **Design**.

f. **Notice** how Word is calling out the header section with a **dotted-line**.

g. **Notice** the words **"Type here"** enclosed in brackets on the left. This is a **placeholder** for an area of the header into which we can enter content. It is **colored gray**, which means it is already selected and ready for us to populate it with content.

h. **Type** "Internet Policy".

2. **Close** header. This can be done in two ways:

a. On the **Header & Footer Tools** contextual ribbon, on the **Design** tab, **click**

Close Header and Footer.

b. By **double-clicking** anywhere within the body of the document. (We'll try this in a minute)

3. **Scroll down** and **notice** that "Internet Policy" appears at the top of every page.

4. Also **notice** that the font color of the text in the header is light gray. This is not the **actual** font color. Microsoft Word makes the header text display in light grey to show that the header is **not currently active**.

5. **Double-click** on the header to make it active. **Notice** how the font color has changed to its real color (black) and the document body text is now dimmed. Again, this is to show that the header/footer is **active**, and the document body is **not active**.

6. Next, let's insert a **footer**.

a. **Note** that, when the header is active, the footer is active as well. **Scroll down** to the bottom of the current page and notice that there is a **Footer** section called-out with a dotted-line.

b. On the **Header & Footer Tools** contextual ribbon, on the **Design** tab, locate the **Header & Footer** group. **Click Footer** to open a list of different footer options.

c. Again, **scroll down** the list to view all the options and then **click Blank (Three Columns).**

d. What we're going to do is, put our **name** in the left placeholder, the **current date** in the center placeholder, and the **page number** in the right placeholder. There are tools on the Header & Footer Tools contextual ribbon to facilitate this.

e. **Click** on the **left** placeholder to select it and **type** your name. *Do not tap Enter*.

f. Let's make our name bold. How would we do this? Because there is no Bold button visible, we have to switch to another ribbon. **Click** the **Home** tab, **locate** the **Font** group and **click** **Bold**. (no need to highlight the name)

g. **Note** how our Header & Footer Tools contextual ribbon is no longer active since we switched to the Home tab. To bring the Header & Footer Tools contextual ribbon back,**click** on its **Design** tab.

h. **Click** on the middle placeholder in the footer to select it. On the **Header & Footer Tools** ribbon, **locate** the **Insert** group and **click Date & Time.** When the dialogue box opens, **click** any date format you wish under the **Available Formats** in the left pane.

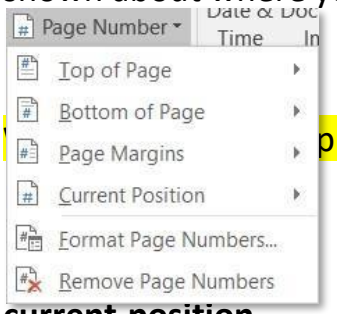
i. **Note** the empty checkbox that says "Update automatically". This would need to be checked if you want the inserted date to change to the current date every time you open this document.

ii. **Click OK**.

i. **Click** on the **right** placeholder. On the **Header & Footer Tools** ribbon**, locate** the **Header & Footer** group and **click Page Number**. A list of options will be

Top of Page	Puts the page number in the header. **Warning**: This will replace your entire header with a new header!

shown about where you want to insert the page numbers (see table below).



place your entire footer with

Page Margins	Puts the page number in the left or right margins.

current position Puts the page number wherever your insertion point is.

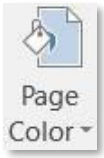
Bottom of the page Put the page number and the footer.

j. **Move** your pointer to **Current Position** and a list of options will open. **Scroll down** the list to the "**Page X of Y**" section and **click Bold Numbers**.

k. **Double-click** in the body of the document to close the Header and Footer Tools.

Adding Visual Interest

1. Changing the **Page Background**:



a. On the **Design** tab, in the **Page Background** group, **click Page Color** to display apalette of colors.

b. **Mouse-over** the colors and **observe Live Preview** changes to your document.

c. **Click** a color that is **fairly dark** (fourth row of Theme Colors).

Tip : The ( )r automatically changes to white when a dark backgroun

2. Adding a **Watermark:**

a. On the **Design** tab, in the **Page Background** group, **click Watermark** to see a list of semi-transparent messages that can be added to your document. **Click** on one of the messages and **note** it's insertion into the document. These messages will be printed should you print the document.

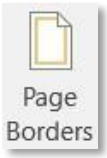
b. You can also **customize** the watermark text. **Click Watermark** again and **click** "Custom Watermark". In the Printed Watermark dialogue box, find the Text

field, **click** into it, **delete** the existing text, and **type** some different text. **Click** OK.

What's the difference between the "Apply" and "OK" buttons?

- **Apply** will commit your changes and **keep** the dialogue box **open** .
- **OK** will commit your changes and **close** the dialogue box.

3. Adding a **Page Border**:

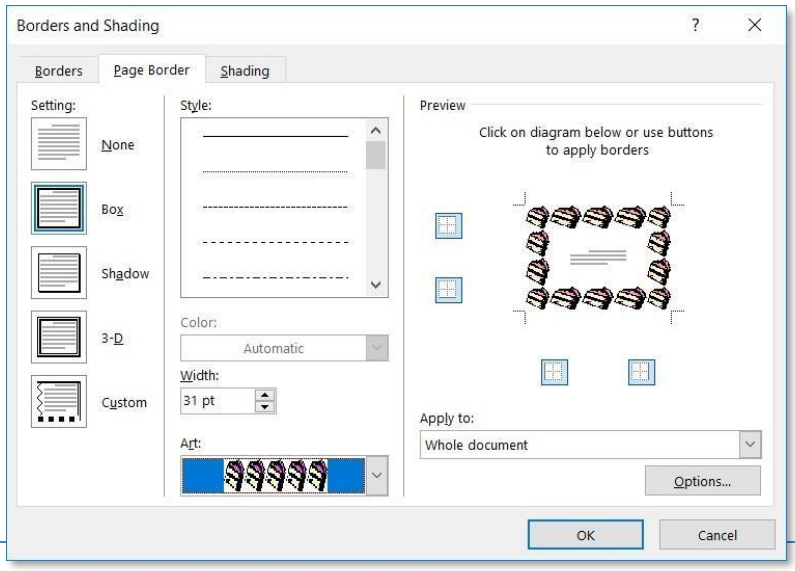


a. To place a border around your document, on the **Design** tab, in the **Page Background** group*,* **click Page Borders.** A **Borders and Shading Dialogue Box** will open.

b. In the **Borders and Shading Dialogue Box,** on the **Page Border tab,** there are options for customizing a border. As you **click** on different settings, styles, colors, etc. in theleft and center panes, **note** a preview in the right pane.

c. In the **Borders and Shading Dialogue Box,** on the **Page Border tab,** in the *left* pane, click on the **Box** setting.

d. In the **Borders and Shading Dialogue Box,** on the **Page Border tab,** in the *center* pane, in the **Art** drop-down list box**, click** the drop-down arrow. **Scroll**



down and **click** a border style that you like. **Click** OK to add the border.

e. **Note** that, depending on how large the border is, it may **cover up** your **header and/or footer**. To fix this, you can adjust the distance between the edge of the page and the header/footer.

i. **Double-click** on the **header** to make it active.

ii. On the **Header & Footer Tools** contextual ribbon, on the **Design** tab, in the **Position** group, there are two text boxes:

1. The **top** one controls the distance between the **header** and the edge of the page.

2. The **bottom** one controls the distance between the **footer** and the edge of the page.

iii. **Increase** the values in both of these text boxes until you can see your header and footer. Note – you will need to click into the footer before you adjust the bottom control.

Save the document and then **close** Word.

Activity 3:

Inserting Online Pictures, Shapes, Text Boxes, and Other Pictures:

Solution:
The insertion of specialized objects into a document can add visual interest. We will explore a few different types of objects in this section and also learn how to format the objects.

Online Pictures
The former name for this type of object was Clip Art. **Clip art** are small pictures and symbols made available for computer users to add to their documents. They can be used to enhance a narrative.

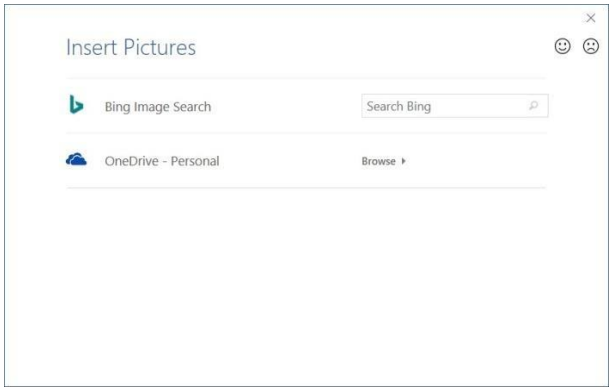
Inserting Online Pictures

1. **Click** in a clear area underneath the table to move your insertion point off of the table.

Teacher's note:
If the student's table is too far down the page, the cursor will get stuck above

the table. If this
happens, the student can **double-click** below the table to place their insertion point there.

2. On the **Insert** tab, in the **Illustrations** group, **click Online Pictures**.
3. A dialogue box opens that prompts us to enter a search term.



4. **Note** the words **Bing Image Search**. Microsoft Word will search the Internet for images using its search engine, Bing (it is a competitor toGoogle).

5. **Type helmet** in the search field and tap Enter.

6. **Note** the gray checkbox labeled "Creative Commons only". Word has filtered the search results
to only show images that are licensed under **Creative Commons** licenses.

a. **What is Creative Commons?** It is a type of copyright license that is frequently used on the internet. In general, it is a liberal license that gives you permission to use the image for free.

b. **HOWEVER**, Creative Commons allows content creators to add "gotchas" such as "cannot use for commercial purposes" or "must provide attribution to the original author". **MICROSOFT WORD DOES NOT SHOW YOU THESE.** So, at the end of the day, it is up to **you** to verify that you are abiding by the author's **SPECIFIC** license terms—and finding the specific license terms is not always an easy task.

c. For this reason, if you are planning to use clip art for any professional purpose, we recommend using a clip art website that contains only **public use** images. One such website is **pixabay.com**. Public use images give you **complete control** over how you may use them. *Later in the lesson we will learn how to insert a picture from pixabay.com into a Word document.*

d. Another alternative is to **purchase** clipart (also called "stock images"). This is how
businesses typically obtain clip art.

7. **Find** a picture you like.

8. **Point** to the image.
9. **Click** on the **three dots** in the bottom-right corner of the image. A screen tip appears above the image containing additional information about the image, including its pixel dimensions and Internet URL.

10. **Click** in a clear space to dismi ss the screen tip.

11. Now, we will insert the image into our document.

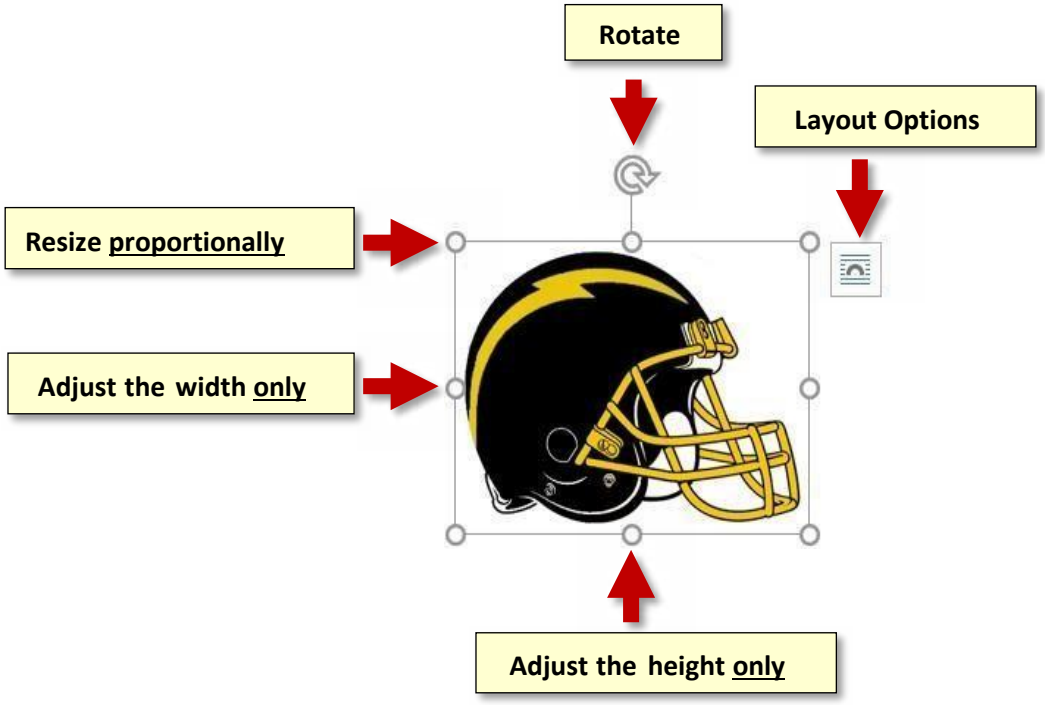
a. **Click** on the picture to **select** it.

b. **Notice** the checkmark that appears in the **top-right** corner of the picture.

c. **Notice** how the Insert button indicates that **one picture** is selected. d. **Click Insert (1)**.

Resizing Inserted Objects

Objects can be resized by using "**handles**" that appear around a selected object.



1. If you cannot already see a border and small circles around your picture, **click** on the picture to select it.
2. **Point** your mouse to one of the circles. These circles are called **resizing handles**. **Notice** the pointer shape changes to a **white arrow with two ends**. As we learned before, this is a **resizing cursor**.
3. Using one of the **corner circles**, **click** and **drag** towards the center of the picture and **note** it resizes the picture **proportionately**. This does not always work with other types of objects. Other objects require you to hold Shift down while resizing to retain the original proportions.

> **Warning**: Increasing the size of an online picture can result in a **distorted look** when printed. To avoid this, try not to make an online picture any larger than it was when you originally inserted it into the document.

4. **Click** and **drag** from one of the **side circles** and **note** the change in shape of the picture. Thesecircles do **not** resize the picture proportionally. **Click Undo**.
5. **Click** and **drag** the **circular arrow icon** above the picture **note** how the picture **rotates**. **ClickUndo** to get it back to its original rotation.

6. **Using** the **rulers** on the top and left edges of document as a reference, **resize** the object
   proportionally to approximately 1 ½" square.

7. **Deselect** the object by clicking in a **blank area**.

   Applying Wrapping Styles
   "Objects can be placed in your document in two ways: either inline or floating. Inline objects are those that reside on the same layer as your text and are positioned within the stream of text that surrounds the object. Floating objects are those that are placed on a layer over the text". –Allen Wyatt

   This positioning of objects is called the **text wrapping style.** The wrapping style can affect how difficult it is to move an object on the page. If it seems difficult to move an object where you want to, then you may need to change the wrapping style:

1. **Select** the picture object and **move** your pointer around on it until you see a **Move** cursor shape.

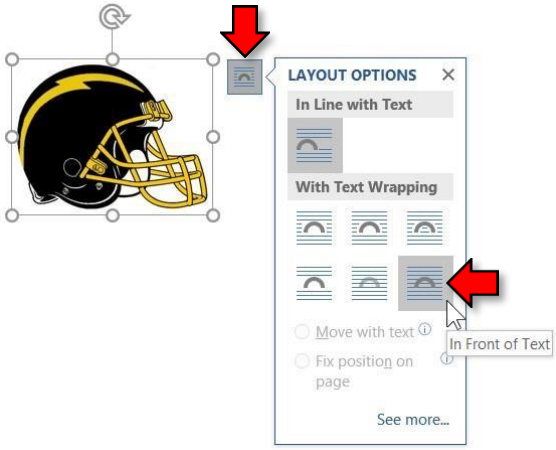
2. When you see this cursor, **click** and **drag**. You should **notice** that it is hard to move the object. We need **to change the wrapping style** so it is easier to move. The default wrapping style for pictures is **In Line with Text**, which means that only text can move it around. This can be veryrestricting.

3. **Click Layout Options** to the **right** of the selected object.

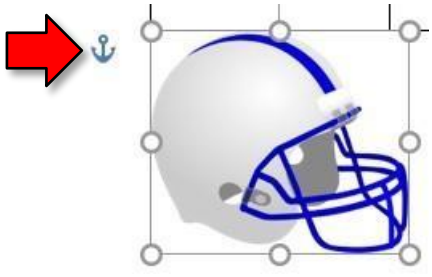
a. It presents you with a set of icons, each of which represent a **wrapping style**.

b. You can get an idea of what each wrapping style does by looking at the icons. The blue, horizontal lines represent your document's text, and the gray arch represents the image.

c. **Point** to the icons to see a **ScreenTip** containing their names. **Click In Front of Text**.



4. **Notice** the small "anchor" symbol that has appeared after we changed the wrapping style to a "floating" style. This is called an **object anchor** and it indicates where a floating object is located in relation to the text in your document. If we were to insert multiple lines of text somewhere in our document above the anchor, it would cause our object to get "bumped" down, even though it is floating.

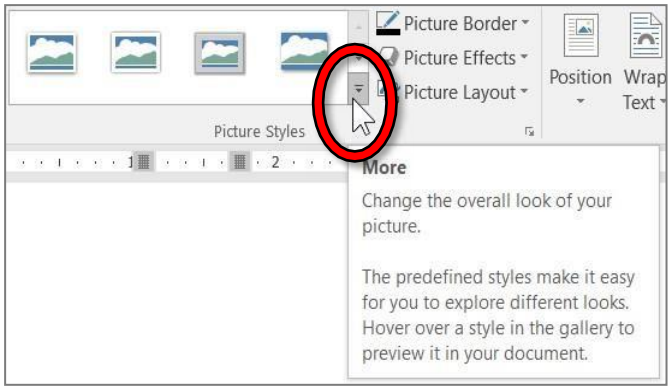


5. **Using** the **move cursor**, **move** your object slightly to the left. You should **see** a **green line**
   appear. This green line helps you to align your object against the left margin of the document.
6. **Move** the object so it is on top of the last column in your table.
7. **Notice** how there are now **two** contextual ribbons: **Table Tools** and **Picture Tools**. This isbecause our picture object is selected *and* it is on top of the table.

a. **Picture Tools** has one tab: **Format**
b. **Table Tools** has two tabs: **Design** and **Layout**

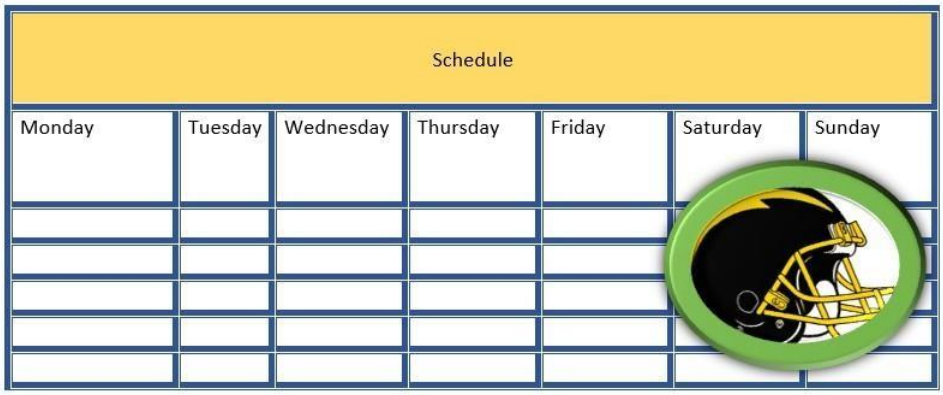
Applying Formatting to Pictures

1. **Click** the picture to select it if it is not already selected.
2. On the **Picture Tools** contextual ribbon, **click** the **Format** tab and, in the **Picture Styles** group, **move** your pointer over the predefined **Picture Styles** thumbnails to see a **Live Preview** of theireffects.
3. **Click** the **More** button to see more predefined styles. As you point to the different styles **note**



the ScreenTips that appear which contain the name of the style. **Click** on the **Metal Oval** style.

4. In the **Picture Styles** group, **click** on **Picture Border** and **click** on any color that you like.
5. **Deselect** the picture.



Shapes

A shape is another type of object that can be inserted into a Word document.

*Let's insert an **arrow shape** into our document*. 

1. On the **Insert** tab, in the **Illustrations** group, **click Shapes**. A menu of shapes will open. The shapes are organized by type of shape.
2. In the **Line** section, **mouse** over the line shapes until you see a ScreenTip that says **Double Arrow** ↘ **. Click** the shape.
3. **Find** your mouse cursor in the document and **note** that it is shaped like a crosshair ┼.
4. We are going to "**draw"** an arrow from our **helmet picture** to the word "**Monday**" in our table.

a. **Point** to the helmet picture.

b. **Click** and **drag** to the word Monday.

c. **Let go** of the mouse button.

5. **Note** the arrow is **selected**. You can tell by the **resize handles** at the ends.

6. With the arrow still selected, **note** the **Drawing Tools** contextual ribbon.

   It has one tab:
   Format. **Click** the Format tab.

7. In the **Shape Styles** group, **click Shape Outline**. **Point** to **Weight** and, on the sub-menu, **click6 pt**.

8. **Click Shape Outline** again. **Mouse over** the colors to see a live preview on your arrow. **Click** acolor to select it.

9. **Point** your mouse at the **body** of the arrow until you see a **Move cursor**. **Click** and **drag** tomove the arrow to another place.

10. **Deselect** your arrow.

11. **Insert** your cursor beneath the table.

Tip: To change the **default line styling** that is used when you create a new line, **right- click** on the line whose style you want to make the default and **click** "**Set as Default Line**".

*Next, we will insert a **star shape**.*

1. On the **Insert** tab, in the **Illustrations** group, **click Shapes**.

and

2. In the **Stars and Banners** section, **mouse over** the shapes until you see **5-point Star** ☆**click** it.

3. **Find** your cursor in the document and **note** that it is shaped like a crosshair +.

4. **Click** next to the insertion point and **drag** diagonally down and to the right. Don't let go of the mouse until the star until it is about 3" square (**use** the document rulers as a guide). **Let go** of the mouse button when you finish dragging.

5. **Remember** that as long as you don't let go of the mouse button, you have **full control** over the size and shape of the drawing.

Tip: Using the corner resize handles on a shape will **NOT** resize the shape proportionally, like with clipart. To resize a shape proportionally, you must hold down Shift while resizing.

5. **Find** the **move cursor** ☆ on the star object and **move** the star to the .**Use** right side of the document the green line to **align** it to the right margin of the document.
6. On the **Drawing Tools** contextual ribbon, on the **Format** tab, in the **Shape Styles** group, **click More** to see a gallery shape styles that could be used. **Mouse over** these Quick Styles to **see** a **live preview of the different styles**. **Scroll** down the gallery and **click** a quick style in the last row.

Clicking between objects may make tabs inactive

1. **Click** on the helmet object again. **Note** that your star shape object has become deselected and the Drawing Tools contextual ribbon associated with it has disappeared.
2. **Note** that **two contextual ribbons** now appear; one associated with the online picture object (Picture Tools) and one with the table (Table Tools). However,

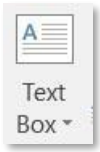
none of the tabs on either contextual ribbon are active.

3. **Click** on the **Design** tab and **note** the background color of the tab is **white**. This is how you can tell it is active.

4. **Click** on the star object again. **Note** that while the Drawing Tools contextual ribbon may appear, its **Format** tab might not be active. If you don't see the tools you expected to see, you may have to **click** on the tab to activate the tool selection.

Text Boxes

A text box is a freestanding object that can contain words. *Let's insert a text box.*



1. **Deselect** the star object.
2. **Click** on the **Insert** tab. In the **Text** group, **click Text Box**. A menu of Built-in text box styles will appear. However, to have more control over format, placement and size, we will draw our own text box. **Click Draw Text Box**.
3. **Click** into your document where you want the text box to start and **drag** diagonally and to the right to where you want it to end.

4. The insertion point within the text box indicates that what you type will be inserted there. **Typeyour name**.
5. **Resize** the text box to just fit around your name.
6. To move your text box*,* **make sure** it is selected*,* then **move** your pointer to the edge of the box until a **move cursor** appears  . Then **click** and **drag** your text box to the **center** of the **star shape**.
7. **Note** that the text box has a **black border** and it is also **filled** with white color.
8. You can change formatting of the text box by using tools on the **Drawing Tools** contextual ribbon.

a. With the text box selected, on the **Drawing Tools c**ontextual ribbon**, click** the **Format**
tab. In the **Shape Styles** group, **click Shape Outline**, and **click No Outline.**

b. Next, In the **Shape Styles** group, **click Shape Fill** and **click No Fill**. **Deselect** the textbox.

Other Pictures

In addition to inserting pictures via Online Pictures, you can also insert images of your own into a document. These images can be ones that you've made yourself (like photos taken with a camera) or ones that you've downloaded from the Internet. We have placed a couple of pictures on the flash drive for you to use in this section.

Inserting a Picture

1. **Open** a new blank Word document.
2. **Click** the **Insert** tab. In the **Illustrations** group, **click Pictures**.
3. In the Insert Picture dialogue box, **navigate** to the flash drive and **click**  **Orchid.jpg**.
4. In the dialogue box, **click Insert.**

Color Effects and Artistic Effects

1. To prep for this section, let's move our picture to the right side of the page. See if you canremember how to do this. This is an important thing to know!

a. **Change** the Text wrapping style to "In front of text".

b. **Click** and **drag** your picture to the right side of your document.

2. On the **Picture Tools** contextual ribbon, on the **Format** tab, **find** the **Adjust** group, and **click** on **Color. Mouse over** the coloring effects that could be applied to your picture.
3. **Click** on the **title bar** to dismiss the gallery.
4. In the **Adjust** group, **click** on **Artistic Effects** and **mouse over** the artistic effects that could beapplied to your picture.

5. **Click** on the **title bar** to dismiss the gallery.Remove Background Effect

1. To prep for this section, we are going add a **dark background color** to the document.

   a. **Click** on the **Design** tab, and in the **Page Background** group, **click** on **Page Color**. b. **Click** a dark color.

   Note: By default, Word will **not print** a page's background color because of the amount of ink required.

2. On the **Picture Tools** contextual ribbon, **click** the **Format** tab and, in the **Adjust** group, **click Remove Background**. Your picture will look like the picture below. Also, a new contextual tabnamed **Background Removal** will open.

3. On the **Background Removal** tab, in the **Refine** group, **click Mark Areas to Keep**.
4. The pointer will change to the **shape of a pencil** when you point to the picture. **Use** the **tip** of
   the pencil to "**click away**" the bright pink sections.
5. In the **Close** group, **click Keep changes**.
6. **Deselect** your picture.

Crop Picture Effect

1. **Open** a new blank Word document.
2. **Insert** another picture from your flash drive. It is named **red-roses-photo.jpg**.

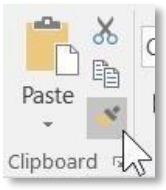
3. On the **Picture Tools** contextual ribbon, on the **Format** tab, **find** the **Size** group and **click** onthe **list arrow** part of the **Crop** split button.
4. **Point** to **Crop to Shape**. In the **Basic Shapes** section of the Shapes menu, **click**

Heart ♡ .

Format Painter

The Format Painter is used to **copy** the **formatting** of a piece of text or picture and **apply** it to something else. For instance, in the case of text, the formatting would be the font face, size, and color. We will use the Format Painter to apply the formatting of one object to another.

1. **Deselect** the **red roses** object which we just cropped to a heart shape (**click** the right margin).
2. **Insert** the **Orchid.jpg** picture from your flash drive again.
3. **Resize** each object **proportionally** (use the corner handles) until they appear side by side.(make them about **3" wide**).
4. **Select** the **red roses** object.
5. **Click** the **Home** tab and in the **Clipboard** group, **click Format Painter**.



6. **Move** the mouse pointer around the screen. **Notice** how the mouse cursor has

changed to an arrow with a paintbrush next to it.

7. **Click** on the orchid object that you just inserted. **Notice** how it now has the

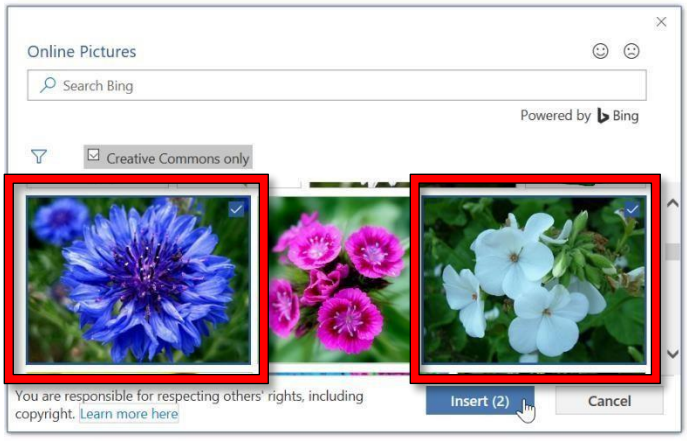
same cropped shape as the red roses object.

8. **Deselect** the orchid object and **note** your cursor shape has returned to an **I-beam shape**.

Double-clicking Format Painter makes it possible to apply a format to more than one object.

Let's try it.

1. **Insert** your cursor to the right of the orchid object and tap Enter.
2. **Search** for **Online Pictures** pictures using the search term **flowers**.
3. In the search results, **locate** two pictures of **flowers** that do not have white backgrounds. Since the search dialogue allows the insertion of multiple objects at one time, **click** each of the two pictures and then **click Insert.**



4. **Resize** each image so they are each about **3" in width**.

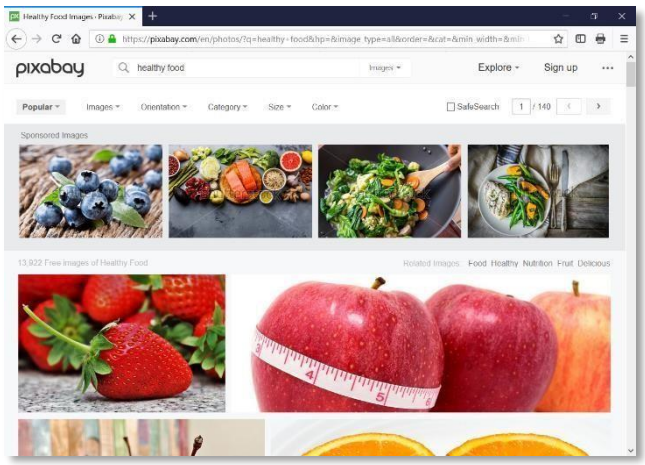
5. **Click** one of the objects that is formatted with a heart shape.
6. **Double-click Format Painter**.
7. **Click** on one of the flower objects and **notice** it ado format.
8. **Deselect** the flower object and **notice** that the cursor to an I-beam.
9. **Click** on the **second flower object** and **notice** it ado format.

10. In order to "**turn off**" the Format Painter, **single-click** on its button in the Home ribbon.

Inserting a Picture from a Webpage

You can also insert images from a webpage into your document. However, be aware that many images on the internet are **protected by copyright**. When you find an image you like, you should read the website's fine print to determine if you can use the image or not. This is especially important if you are making a presentation for commercial purposes (for example, as part of your job).

1. **Open** a new, blank document.
2. Using the Start Menu, **open Firefox**.
3. **Click** into the **address bar** at the top of the screen and **type www.pixabay.com**. Pixabay is a website that contains images that you can download and use for free, withoutrestriction. Enter
4. **Type** "**healthy food**" into the search box and **tap** .
5. **Click** on an image you like (except for the ones in the first row—those cost money).



6. On the next screen, **notice** the **copyright notice** on the right. It says "**CC0 Creative Commons**". This means you can use the image however you want. You don't even have to give the original author credit.
7. **Right-click** in the **middle** of the image and **select Copy Image**.

Tip: If you're planning on printing the document, it's best to use a **high-**

resolution version of the image. To do this, click the green “Free Download” button on the right. This will download an image file to your hard drive. Then, follow the instructions found in the “Inserting a Picture” section to insert the image file into the presentation.

8. Using the **taskbar, switch back** to **Word**.
9. In the **Home** tab, in the **Clipboard** group, **click** the **Paste button proper**.
10. **Close** Firefox.

3) Graded Lab Tasks:

Note: The instructor can design graded lab activities according to the level of difficulty and complexity of the solved lab activities. The lab tasks assigned by the instructor should be evaluated in the same lab.

Lab Task 1

Create a short report on topic of your choice which includes the following:

- *Title page*
- *Table of Content*
- *Tables/Figures with captions.*

Assignment # 2 (CLO-2)

Q) Create a Simple Professional CV Using Microsoft Word.

***Objective**:*

The purpose of this assignment is to guide you in creating a basic professional CV (Curriculum Vitae) using Microsoft Word. You will practice key features such as text formatting, bullet points, tables, and inserting objects. This will help you build confidence in using Word's basic tools to create a clean and well-organized document

Lab 07 Introduction to Power Point

Objective:

In this lab the students will be able to combine text, graphics, and predesigned backgrounds to createprofessional presentations.

Activity Outcomes:

The students will be able to:

- Prepare a professional Presentation
- Add animations and sounds to the slides.

Instructor Note:

As a pre-lab activity, read “Microsoft power point” Guide shared on google classroom.

1) Useful Concepts

MS PowerPoint is a program that is included in the Microsoft Office suite. It is used to makepresentations for personal and professional purposes.

In this manual, we shall discuss in detail the functions and features of a PowerPoint presentation.

The following elements can be added to a PowerPoint slide:

- Clip Art
- Graphs
- Tables
- Photographs
- Charts
- Media Clips
- Videos

2) Solved Lab Activities

Sr.No	***Level of Complexity***	***CLO Mapping***
1	***Medium***	***CLO-2***
2	***Medium***	***CLO-2***

Activity 1:

Making Presentation Slides

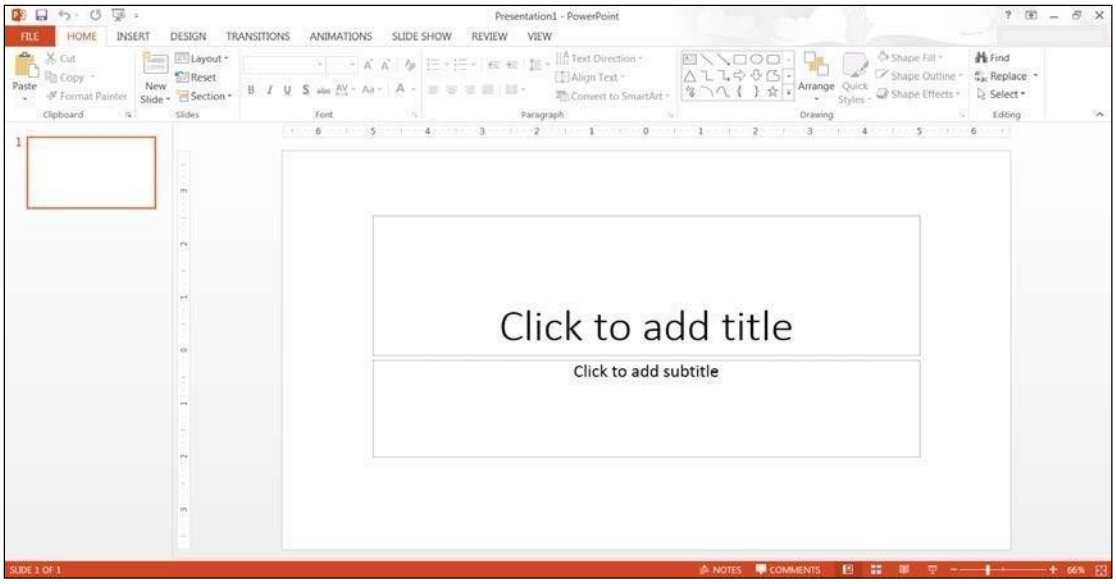
Solution:

Slides in a presentation are similar to pages in a word processing document. All slides and graphics are saved in one file (example: **keys.ppt**). Use the PowerPoint file to present the information in thefollowing ways:

- **On-screen slide show:** The keys.ppt file displays the slide show on a monitor or computer projected large screen.
- **Web pages:** The keys.ppt file can be saved as Web page and then published on the Web.
- **Overhead transparencies:** The keys.ppt file can be printed as transparencies (**Important:** Make sure the appropriate transparencies are used for your printer model. The wrong typeof transparencies can melt inside your printer.).
- **Handouts:** The keys.ppt file can print two to nine mini slides per page.

Create Slide Presentation:

This section will teach the basics of opening PowerPoint and beginning a presentation. When PowerPoint is launched the **Presentation** window will appear.



When creating a new presentation, you have choices about how to proceed. PowerPoint gives you a range of ways with which to start creating a presentation. You can start your presentation with:

- **Blank:** Slides that are unformatted and have no color scheme.
- **Design:** Slide Themes that have design concepts, fonts, and color schemes.

- **Template on Microsoft.com:** Microsoft Office Templates and Theme Gallery which are arranged according to type (Click on the **File** tab, select the **New** option, and then click on **PowerPoint presentations and slides** from the **Available Templates and Themes**.).

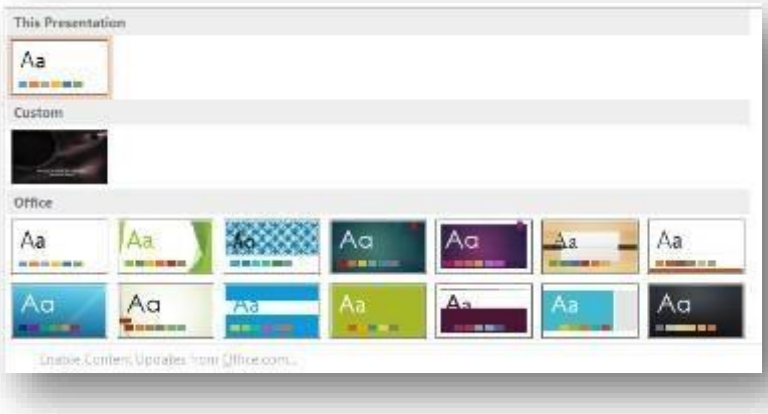
This workshop section will focus on using a Design Theme.

A. Des

A Theme gives your slides a consistent appearance throughout your presentation. Themes contain color schemes with custom formatting, styled fonts, and layouts. When you apply a design template to your presentation, the slide master and color scheme of the template replaces the original blank slide.

1. Select the **Design** tab, then on the **Theme** group, click on the drop-down arrow next tothe last Theme.

2. The **All Themes** window will appear with available presentation Themes.



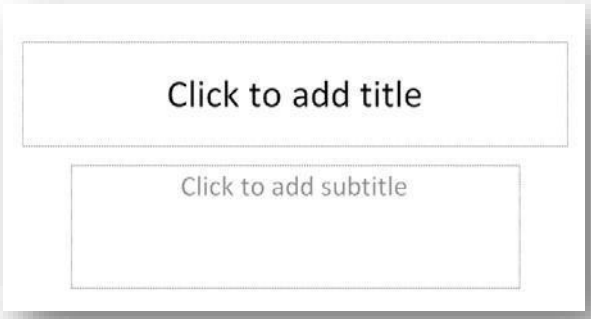
3. Hover the mouse pointer over a Theme to preview it.

4. Click on a **Theme** of your choice.

Note: You can change the Theme during or after the creation of your PowerPoint file.

B. Add Text

The template for the design Theme you select will determine the font type and text alignment. PowerPoint places all information (text and graphics) contained on a slide in separate **Placeholders**. Placeholders are designated by dotted lines; they appear on a slide as guides, but they will not appear on the finished presentation. In order to edit text, click once inside of the **Text Placeholder** and the insertion point will appear; then begin to type your text.



1. Click in the **Title Placeholder** and type the text title below.

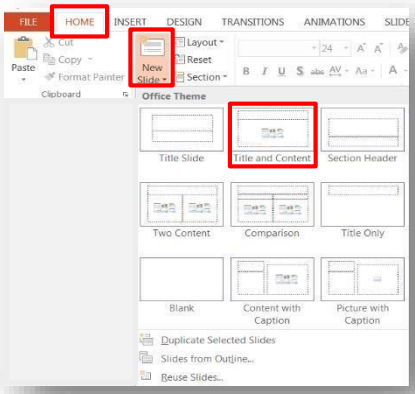
2. Click in the **Subtitle Placeholder**.

3. Type the text below (You will need to press the **Enter** key after each line of text.).

4. **Save** the presentation. Click on the **File** tab and then click on **Save As**. The **Save As** window will open. In the **File name** box, type **Keys to Success** for the presentation name.
The instructor will indicate where to save the file. Click on the **Save** button.

Add New Slide

A slide layout defines the placement of text, pictures, tables, and graphs. If you change the layout of a slide, the text and graphics remain intact. You can resize text and graphic boxes to conform to the newlayout

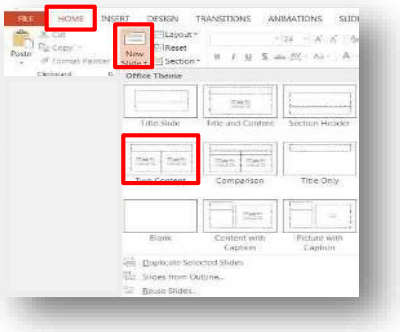


1. On the **Home** ribbon, located in the **Slides** group, click on the **New Slide** drop-down arrow. The Office Theme panel will appear with multiple slide layouts. Select your desired slide layout.

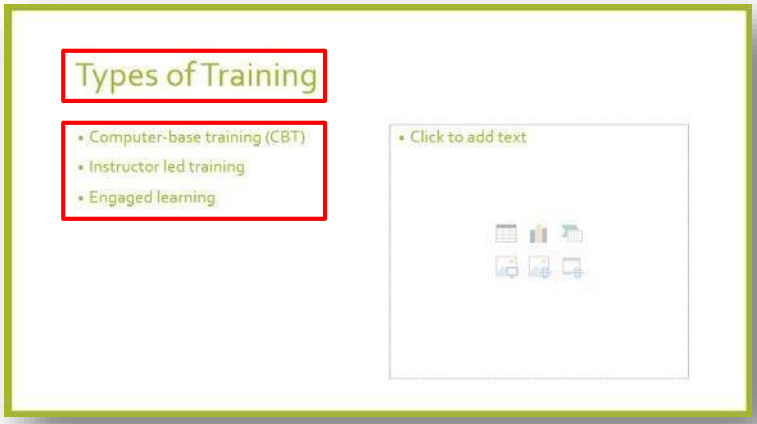
2. For this exercise, click on the second Layout (**Title and Content**) in the first row.
3. In the **Title Placeholder**, type the text **Agenda** as seen above.

4. In the **Text Placeholder**, type the bulleted text as seen above (You will need to press
Enter after each line of text.).

5. Add another new slide.

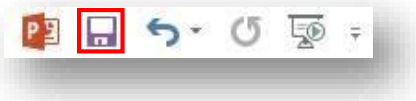


6. On the **Home** ribbon, click on the **New Slide** drop-down arrow and then select



the **Two Content** slide layout (This slide contains a title, text, and clip art placeholders.).

7. Click inside the **Title and Text Placeholders** and type the text shown above.



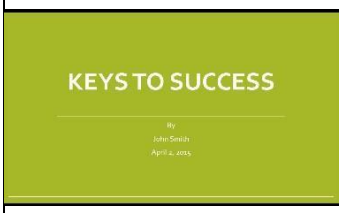
8. On the **Quick Access Toolbar**, click on the **Save** button to save your presentationchanges.

Activity 2:

Editing Techniques
Solution:
This section will teach you basic techniques for editing slides.

View Modes for Editing

The **Normal**, **Slide Sorter**, **Reading**, and **Slide Show** Views allow you to type, edit, and view your presentation. To switch between views, click the **View** Options sat the lower right-hand side of the PowerPoint window.

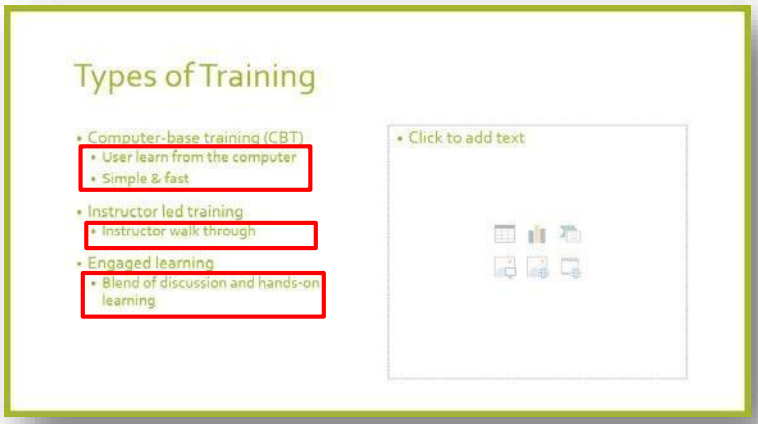
Normal View 	Normal View is the main editing View, which you use to write and design your presentation. The View has three working areas: on the left, tabs that alternate between an outline of your slide text (**Outline** tab), and your slides displayed as thumbnails (**Slides** tab); on the right, the slide pane, which displays a large view of the current slide; and on the bottom, the notes pane.
Slide Sorter View 	Slide Sorter View is an exclusive view of your slides in thumbnail form. When you are finished creating and editing your presentation, Slide Sorter gives you an overall picture of it — making it easy to reorder, add, or delete slides, and preview your transition and animation effects.
Reading View 	Reading View is new in PowerPoint 2013. It is similar to Slide Show View. The difference between the two Views is that while Slide Show View takes over the whole screen, the slide in Reading View is shown in full screen, but you will see the PowerPoint title band at the top of the screen. The PowerPoint status bar and the Windows task bar are also displayed at the bottom of the screen.

Slide Show View 	Slide Show View takes up the full computer screen, like an actual slide show presentation. In this full-screen View, you see your presentation the way your audience will. You can see how your graphics, timings, movies, transition effects, and animation elements will look in the actual show.

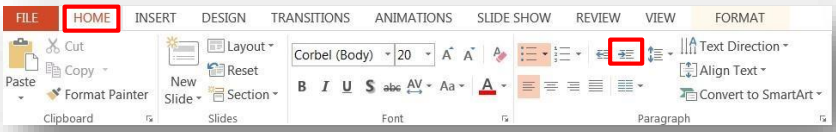
B. Edit Bulleted List

Typing text in PowerPoint is similar to typing in other applications. However, since PowerPoint deals with bulleted lists, a few keystrokes will be identified to help in typing multiple lines.

1. Confirm you are on **slide three**.



2. In **Normal** View, edit the bulleted list to include the circled text above. Place theInsertion bar after each line of the bulleted text and then press the **Enter** key.



3. To add a sub-bullet, click on the **Increase Indent** button, located on the **Home** ribbon.The **Tab** key can also be used to indent text.

4. Type the text and if additional sub-bullets lines are needed press the **Enter** key, afteryour line of text.

> **Note:** Pressing **Enter** after any text returns the cursor to the same indent (paragraph) level for the next line. The Tab key is also used before typing to indent text to the next indent level (sub-bullet point) and pressing **Shift+Tab** before typing to return to the previous indent level.

C. Add Pictures

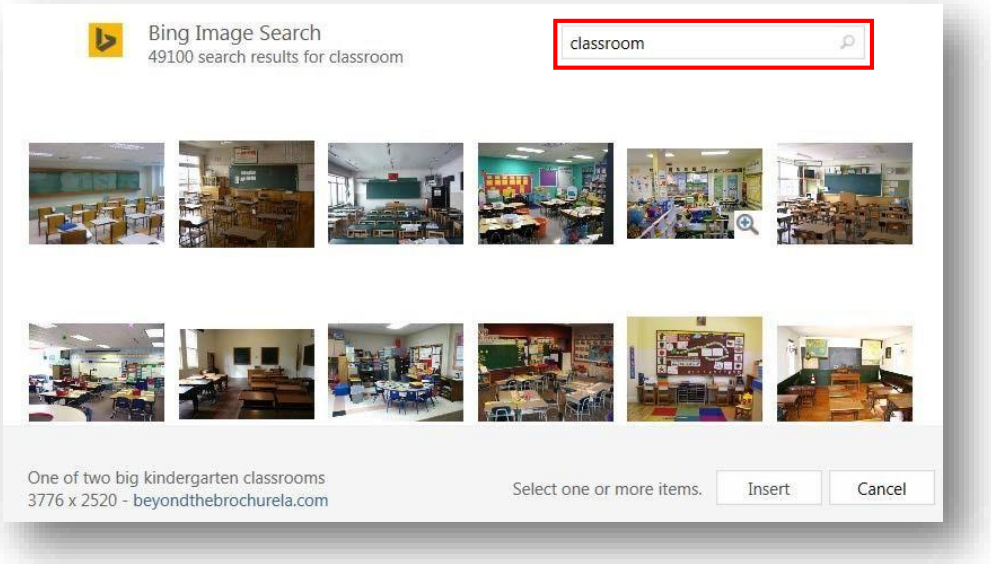
Online Pictures are any type of computerized images such as artwork and

photos. You can make your presentation more eye-catching and entertaining by adding Pictures.

1. Confirm you are on **slide three**.

2. Click on the **Online Picture** button in the **Illustration** box, located in the **Text Placeholder**.

3. The **Bing Image Search** window will appear.



4. In the **Search** box, type the word **Classroom**, and then press the **Enter** key. A varietyof online images associated with your search will appear.

5. Scroll through the **Pictures** window to find your desired image.

6. To insert the image, place the mouse pointer on the image and then click on the leftmouse button twice.

3) Graded Lab Tasks

Note: The instructor can design graded lab activities according to the level of difficulty and complexity of the solved lab activities. The lab tasks assigned by the instructor should be evaluated in the same lab.

Lab Task 1

Make a presentation (10 slides) on different Input/Output devices (Chapters 2 and 3 of textbook). Use different effects, animations, transitions and a custom Master Slide.

Note: *this should be a formal presentation. Take care of font size, font color, font names, and other styles and animations accordingly.*

Lab 08 - 10 Introduction to MS Excel

Objective:

It will enable students to understand and use MS Excel. How to create MS Excel document, use rows and columns.

Activity Outcomes:

The students will be able to:
 Create, edit, and format Excel sheets with text, numbers, and basic functions.
 Import, export, and validate data while using conditional functions to analyze and filter information.
 Generate professional reports and print Excel sheets with proper formatting.

Instructor Note:

As a pre-lab activity, read “Microsoft Excel” guide shared in google classroom for detail guidelines.

1) Useful Concepts

MS Excel is a commonly used Microsoft Office application. It is a spreadsheet program which is used to save and analyze numerical data. Excel is typically used to organize data and perform financial analysis. It is used across all business functions and at companies from small to large.

The main uses of Excel include:

- Data entry
- Data management
- Accounting
- Financial analysis
- Charting and graphing
- Programming
- Time management
- Task management
- Financial modeling
- Customer relationship management (CRM)
- Almost anything that needs to be organized!

2) Solved Lab Activities

Sr.No	*Level of Complexity*	*CLO Mapping*
1	*Low*	*CLO-2*
2	*Medium*	*CLO-2*
3	*Medium*	*CLO-2*

Activity 1:

Conditional Formatting

Solution:

Conditional formatting allows you to change the appearance of a cell, based on criteria thatyou define, using predetermined rules in Excel.

Highlight Cells Rules

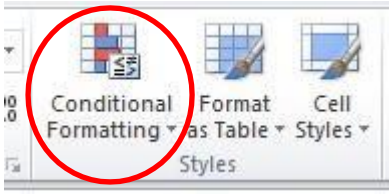
Using the highlight cells rules, you can highlight cells in your data that are greater or less than a value, between or equal to a value or contain a specified or duplicate value.

Greater Than

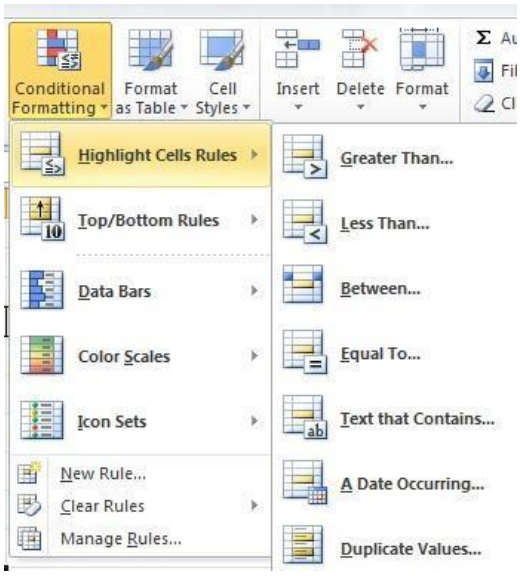
To highlight cells which contain data greater than a specific value:

1. Highlight the data range.

2. Select the *Conditional Formatting* tool



3. Hover over *Highlight Cells Rules* to reveal the menu of different rules.



4. Select *Greater Than* from the menu to open the Greater Than dialogue box:

5. Enter the value that you want to set as your lower limit for the Greater Than condition.

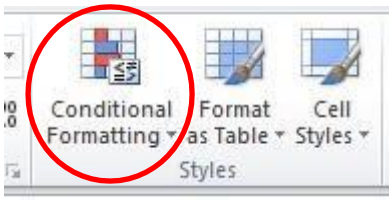
6. Select the type of formatting from the dropdown menu.
7. Select Ok.

The cells which contain a value greater than the value you specified will now appear with thecell formatting which you selected.

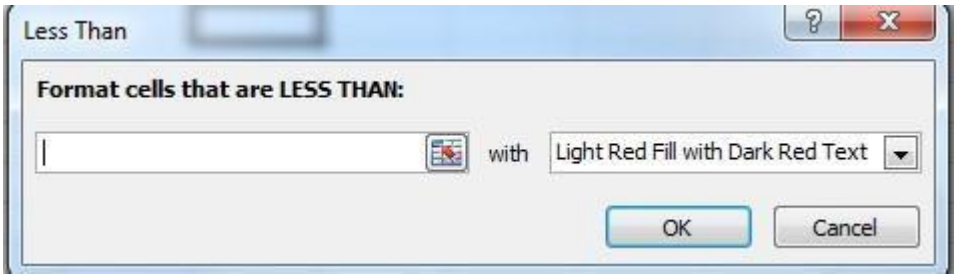
Less Than

To highlight cells that contain data less than a specific value:

1. Highlight the data range.
2. S elect *Conditional Formatting* .



3. Hover over *Highlight Cell Rules*.
4. Select *Less Than* to open the Less Than dialogue box.



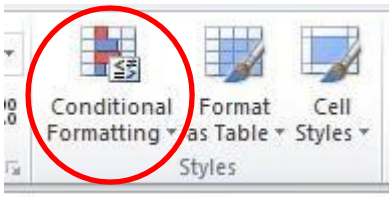
5. Enter the value that you want to set as your upper limit for the Less Than condition
6. Select *Ok*.

The cells which contain a value less than the value you specified will now appear with the cellformatting which you selected.

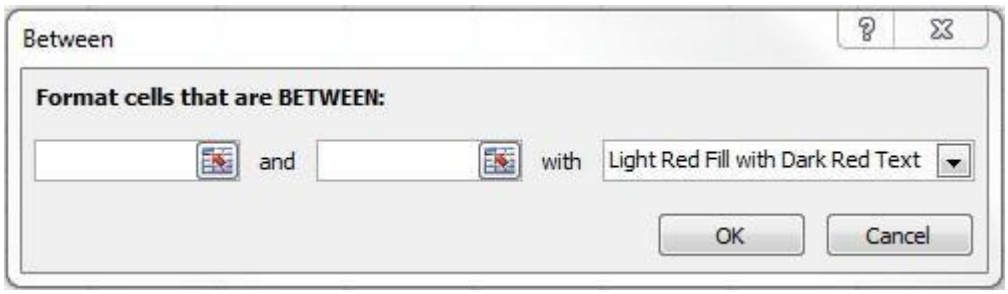
Between

To highlight cells between two specific values:

1. H ighlight the data range.
2. S elect *Condition al Formatting* .



3. Hover over *Highlight Cells Rules* to reveal the menu of different rules.
4. Select *Between* to open the Between dialogue box.



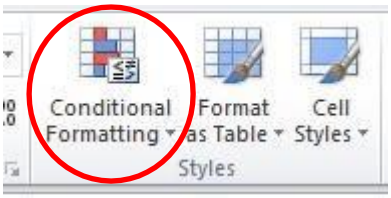
5. Enter the lower limit in the first box and the upper limit in the second box.
6. Select the cell formatting.
7. Select *Ok*.

The cells which contain a value between the two specified values will now appear with thecell formatting which you selected.

Equal To

To highlight cells equal to a specific value:

1. Highlight the data range.
2. Select *Conditional Formatting*.



3. Hover over *Highlight Cells Rules*.
4. Select *Equal To* to open the Equal To dialogue box.

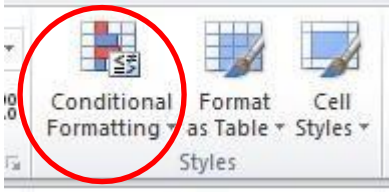
5. Enter the value that you're looking for.
6. Select the type of cell formatting you wish to use.
7. Select *Ok*.

The cells which contain the specified value will now appear with the cell formatting whichyou selected.

Text That Contains

To highlight cells that contain a certain character(s):

1. H ighlight the data range.
2. S elect *Conditional Formatting* .



3. Hover over the *Highlight Cells Rules*.
4. Select *Text That Contains* to open the Text That Contains dialogue box.

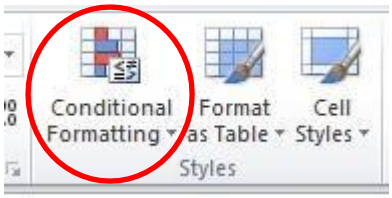
5. Enter the character(s) you're looking for.
6. Select the type of cell formatting you wish to use.
7. Select *Ok*.

The cells which contain the specified character(s) will now appear with the cell formattingwhich you selected.

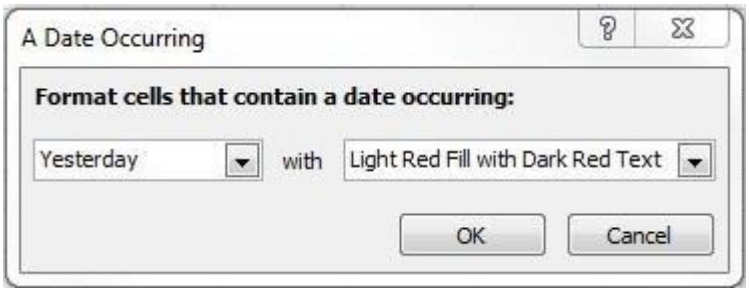
A Date Occurring

To highlight cells that contain a certain date or date range:

1. Highlight the data range.
2. S elect *Conditional Formatting* .



3. Hover over the *Highlight Cells Rules*.
4. Select *A Date Occurring* to open the Date Occurring dialogue box.



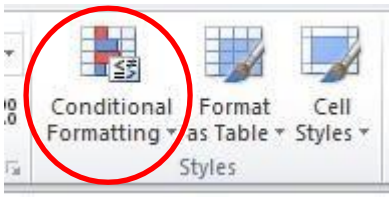
5. Select the date or date range that you're looking for.
6. Select the type of cell formatting.
7. Select *Ok*.

The cells which contain the specified date or date range will now appear with the cellformatting which you selected.

Duplicate Values

To highlight cells that contain either duplicate or unique values:

1. Highlight the data range.
2. Select *Conditional Formatting* .



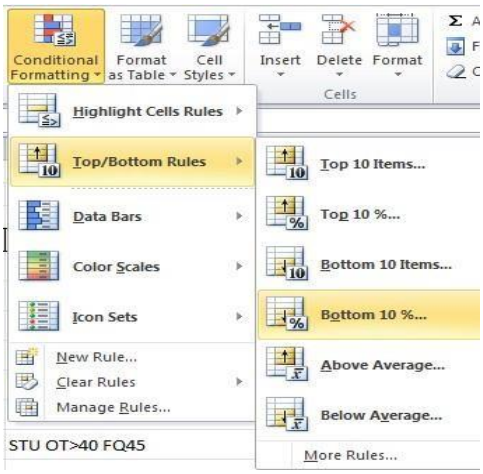
3. Hover over *Highlight Cells Rules*.
4. Select *Duplicate Values* to open the Duplicate Values dialogue box.

5. Select either *Duplicate* or *Unique* from the drop down menu.
6. Select the type of cell formatting you wish to use.
7. Select *Ok*.

The cells which contain either duplicate or unique values will now appear with the cellformatting which you selected.

Top/Bottom Rules

Top and bottom rules can be used to highlight cells that are the top or bottom ten items or the top or bottom ten percent. They can also be used to identify items above or below the average.



Activity 2:

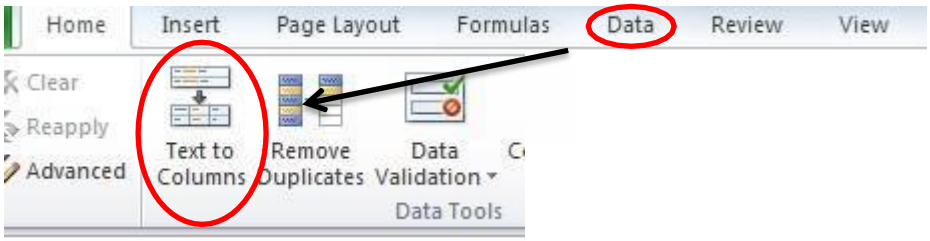
Separating Text within a Cell

Solution:

When data is combined within a cell, such as a first and last name, Excel is able to separate this datainto two cells.

To separate data within a cell:

1. Insert a blank column to the right of the column containing the merged data.
2. Highlight the column of full names.
3. Select the *Data* tab.
4. Select *Text to Columns* .

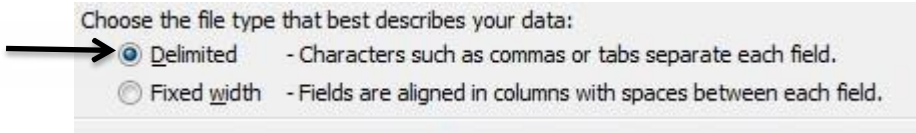


The Convert Text to Columns Wizard dialogue box will.

5. Choose the appropriate data type.

To separate a column based on punctuation characters, select *Delimited*.
To separate a column based on spaces between each field, select *Fixed Width*.

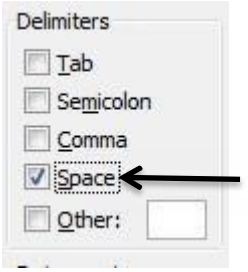
For this example we will select *Delimited*.



6. Select *Next*.

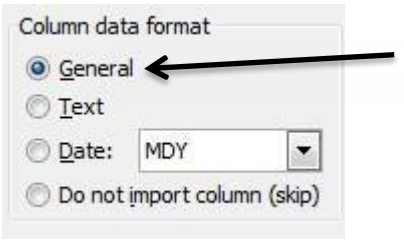
7. Choose your delimiters for the text separation.

   For this example select *Space*.



8. Select *Next*.

9. Select the data format for each column. For this example select *General*.



10. Select *Finish*.

Data will be displayed as separate columns

Sallie Shaffer	→	Sallie	Shaffer
Joseph Garcia		Joseph	Garcia
Sallie Shaffer		Sallie	Shaffer
Surhid Gautam		Surhid	Gautam
Charles Dennis		Charles	Dennis
Yasmine Johnson		Yasmine	Johnson
Kathleen Chilton		Kathleen	Chilton
Kathleen Chilton		Kathleen	Chilton
Helen Martin		Helen	Martin
Helen Sue Martin		Helen	Martin
Joseph Garcia		Joseph	Garcia
Sallie Shaffer		Sallie	Shaffer
Mark Abraham		Mark	Abraham
Mark Abraham		Mark	Abraham
Surhid Gautam		Surhid	Gautam
Carmen Roberts		Carmen	Roberts

Activity 3:

Use of Functions and Formulas

Solution:

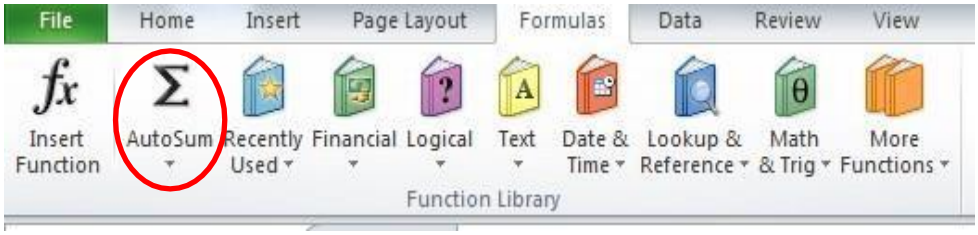
Excel has many different functions and formulas which can be used to manipulate data in a variety of ways, such as sums, subtotals, averages, number counts, maximums, and minimums.

Sums: One of the most commonly used functions of Excel is summation. If you have a data table for a single student with amounts and dates of payment, to find the sum of all payments, you would use the summation function.

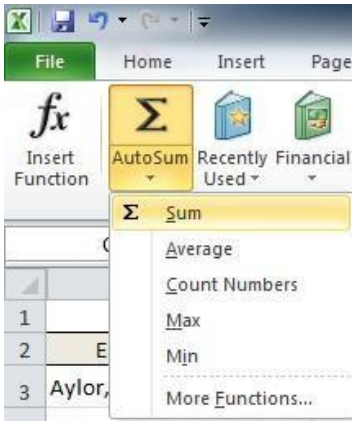
Last Name	First Name	Banner ID	Amount Paid	Date Paid
Smith	John	745082	3,000	9/8/2013
			2,500	10/12/2013
			1,500	12/10/2013
			2,000	3/15/2014
			1,000	6/10/2014

To add numbers in a column:

1. Select the cell directly beneaththe last entry.
2. Select *Auto Sum* located on the *Formulas* tab.

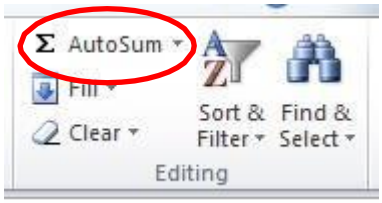


3. Select the *AutoSum* button
4. This will select all items within the column
5. Click the *Enter* key on your keyboard to calculate the sum of all fields. Other functions are available by selecting the AutoSum dropdown



Other functions include: averaging the numbers in a column, counting the numbers in a column and finding the minimum and/or maximum numbers in the column.

Additionally, there is an *AutoSum* button and dropdown menu also located on the Hometoolbar.



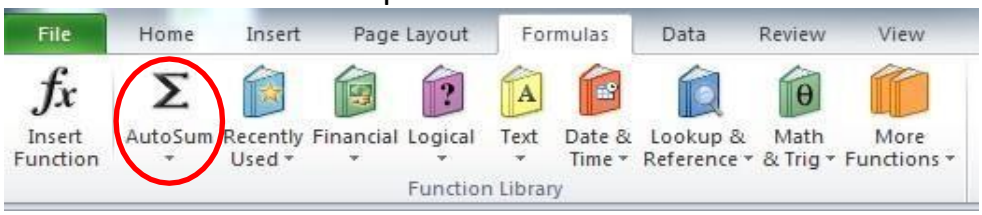
Average

To find the average of a select range of data:

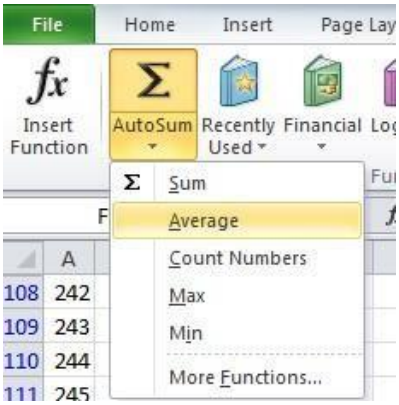
1. Select the cell directly beneath the range of data

Last Name	First Name	Banner ID	Amount Paid	Date Paid
Smith	John	745082	3000	9/8/2013
			2500	10/12/2013
			1500	12/10/2013
			2000	3/15/2015
			1000	6/10/2015

2. Select the *Auto Sum* dropdown on the Formulas tab.



3. Choose *Average* from the Auto Sum dropdown:



4. Select the range of cells to calculate
5. Click *Enter* on your keyboard

Last Name	First Name	Banner ID	Amount Paid	Date Paid
Smith	John	745082	$3,000	9/8/2013
			$2,500	10/12/2013
			$1,500	12/10/2013
			$2,000	3/15/2015
			$1,000	6/10/2015
			$2,000	

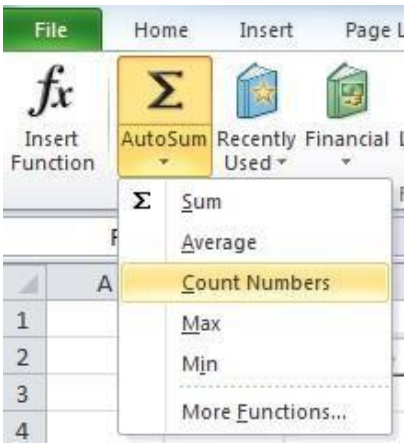
Count Numbers

To count the number of items in a range of data:

1. Select the cell directly beneath the range of data.

Last Name	First Name	Banner ID	Amount Paid	Date Paid
Smith	John	745082	3000	9/8/2013
			2500	10/12/2013
			1500	12/10/2013
			2000	3/15/2015
			1000	6/10/2015

2. Select the *Auto Sum* dropdown.
3. Select *Count Numbers*.



4. Select the range of cells to calculate.
5. Click *Enter* on your keyboard.

Last Name	First Name	Banner ID	Amount Paid	Date Paid
Smith	John	745082	3000	9/8/2013
			2500	10/12/2013
			1500	12/10/2013
			2000	3/15/2015
			1000	6/10/2015
			5	

Maximum and Minimum

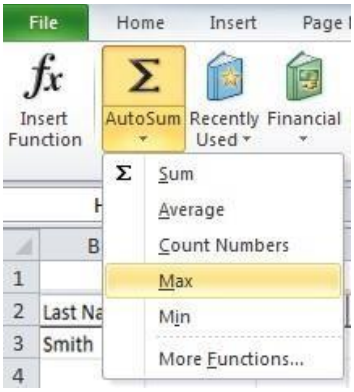
To calculate the Maximum or Minimum for a range of data:

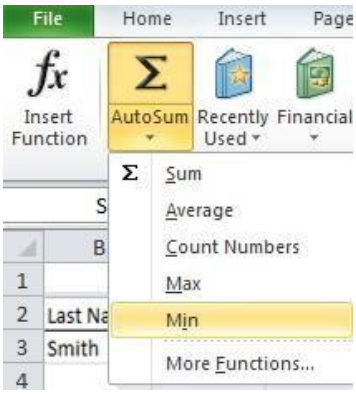
1. Select the cell directly beneath the range of data.

Last Name	First Name	Banner ID	Amount Paid	Date Paid
Smith	John	745082	3000	9/8/2013
			2500	10/12/2013
			1500	12/10/2013
			2000	3/15/2015
			1000	6/10/2015

2. Select the *Auto Sum* dropdown.

3. Select *Max* or *Min* to calculate the maximum or minimum values





6. Select the range of cells to calculate.
7. Click *Enter* on your keyboard to calculate the value.

3) Graded Lab Tasks

Note: The instructor can design graded lab activities according to the level of difficulty and complexity of the solved lab activities. The lab tasks assigned by the instructor should be evaluated in the same lab.

Lab Task 1

The Sales Invoice

Use the template below and create your own invoice for purchased products. You can sell any product at any price, but you must include General sales tax, discount percentages and at least four items in your invoice. Do all formulas required. Format the invoice for clarity.

Item	Quantity	List Price	Discount	Your Price	Total
Lays	10	9	0.5	8.5	85
Subtotal					

G. Sales Tax(GST @17% of the price)	
Amount Due	

Lab Task 2

The CSC101 Grade Book

Recreate the table shown below. Determine the average for each student's final grade. Alphabetize the list. Using the IF statements, calculate the letter grade for each student whereby anything over 90 is an A, 80 is a B, 70 is a C, 60 is a D and anything lower is an F. Chart the final grades in a bar chart.

Name	Exam 1	Exam 2	Exam 3	Final	Final Grade	Letter Grade
Asad	80	88	87	94		
Amir	99	92	96	100		
Atique	85	99	82	95		
Ayesha	56	76	74	70		
Khurram	45	35	56	60		
Rizwan	100	90	95	100		
Nusrat	75	88	97	89		
Salman	90	90	85	89		

Lab Task 3

Class Make-up

Create a chart for each:

- *There are 28 students in a class. 10 are freshmen, 8 sophomores, 4 juniors, and 1 senior.5 people did not answer the question;*
- *There are 11 men and 17 women – do a pie chart for this.*
- *If only 23 of the students did the homework assignment, what percent of the class is that?Another pie chart.*

LAB Task 4

Vacation Budget

Before you create the worksheet in Excel, explain where you want to go and what

kind of activities you would like to do while you are there in a Word Document. What is your proposed budget? Set up your worksheet for transportation costs (airfare, car rental, trains, etc.), accommodations, food, sightseeing and shopping. Include any other activities you might enjoy. Include a 10% contingency plan for emergencies.

Lab 11 to 13 Manual: Computer Networks

Objective:

The purpose of this lab is to provide a comprehensive introduction to computer networking. Students will gain practical experience with fundamental networking concepts, hardware devices, topologies, IP addressing, and basic network configurations. By the end of this lab, students should have a solid understanding of how networks operate and how different components interact to enable communication and resource sharing.

Activity Outcomes:

After completing this lab, students should be able to:

1. Define a network and understand its core purposes.
2. Identify common networking devices and their roles in a network.
3. Differentiate between network topologies and their applications.
4. Configure and verify IP addresses for devices on a network.
5. Set up and test basic network connectivity using tools like the ping command.

1. Introduction to Networking Basics

What is a Network?

A **network** consists of multiple connected devices (e.g., computers, printers, servers) that share resources, communicate, and transfer data. Networks are classified by their size and purpose, including:

- **LAN (Local Area Network)**: Connects devices in a small, localized area, like a home, school, or office.
- **WAN (Wide Area Network)**: Extends over larger geographical areas, connecting multiple LANs.
- **Intranetwork vs. Internetwork**: An intranetwork refers to a network within an organization, while internetwork refers to interconnected networks that may be privately or publicly owned.

Network Benefits

- **Resource Sharing**: Enables devices to share resources like printers, files, and internet connections.
- **Communication**: Facilitates communication through emails, file sharing, and video conferencing.
- **Data Management**: Centralized data management simplifies data storage, retrieval, and security.

2. Network Topologies

Network Topology describes the physical or logical arrangement of network devices. Common topologies include:

1. **Star Topology**: Each device connects to a central hub or switch.

- **Advantages**: Easy to add or remove devices; if one device fails, others remain unaffected.
- **Disadvantages**: If the central device fails, the entire network is affected.

2. **Bus Topology**: All devices are connected to a single communication line (bus).

- **Advantages**: Simple and cost-effective for small networks.
- **Disadvantages**: Performance degrades with many devices; if the bus fails, the network is disrupted.

3. **Ring Topology**: Devices are connected in a closed-loop, where data travels in one direction.

- **Advantages**: Minimal collisions due to unidirectional data flow.
- **Disadvantages**: If one device fails, it can affect the entire network unless there's a backup path.

4. **Mesh Topology**: Each device is connected to every other device.

- **Advantages**: High redundancy and fault tolerance; if one link fails, others are available.

- **Disadvantages**: Expensive and complex for large networks.

3. Network Devices

Various devices facilitate data flow and connectivity in a network:

- **Router**: Routes data between networks, connecting different network segments and managing traffic. It's commonly used to connect a local network to the internet.
- **Switch**: Operates within a local network, forwarding data to devices based on MAC addresses. It improves efficiency by sending data only to the intended device rather than all devices in the network.
- **Hub**: Similar to a switch but less intelligent, a hub sends data to all connected devices, leading to potential collisions and inefficiencies.
- **Repeater**: Amplifies or regenerates a signal to extend the network range, essential in large networks to prevent data degradation.
- **NIC (Network Interface Card)**: Allows a computer to connect to a network. NICs can be wired or wireless and are integrated into most modern devices.
- **Wireless Access Point (WAP)**: Connects wireless devices to a wired network, providing additional access points in a network to accommodate more devices.

4. IP Addressing

IP (Internet Protocol) Addressing is crucial for identifying and communicating between devices in a network. Each device is assigned a unique IP address, serving as its digital identifier.

Types of IP Addresses:

1. **IPv4**: The most common format, consisting of four numbers (each between 0 and 255), separated by dots (e.g., 192.168.1.1).
2. **IPv6**: Designed to address IPv4 limitations, using a longer format with hexadecimal notation (e.g., **2001:0db8:85a3:0000:0000:8a2e:0370:7334**).

IP Address Classes:

IPv4 addresses are divided into classes, each suited for specific network sizes:

- **Class A**: Large networks (e.g., 10.0.0.0)
- **Class B**: Medium-sized networks (e.g., 172.16.0.0)
- **Class C**: Small networks (e.g., 192.168.1.0)

Dynamic vs. Static IP Assignment

- **Dynamic IP**: Assigned by a DHCP server, changing periodically.
- **Static IP**: Manually configured and remains consistent.

Network ID and Host ID
Each IP address consists of two parts:

- **Network ID**: Identifies the network segment.
- **Host ID**: Identifies the specific device within the network.

5. Lab Tasks and Activities

Task 1: Identifying Network Devices and Topology

1. **Objective**: Understand the role of each network device and recognize different topologies.
2. **Steps**:

- Examine various network devices (e.g., router, switch, hub) provided in the lab.
- Identify each device's function and observe how it interacts with other devices.
- Sketch a sample network diagram using a topology of your choice, labeling the devices.

Task 2: Setting Up a Basic Network with Packet Tracer

1. **Objective**: Use Cisco Packet Tracer to simulate a simple LAN network.
2. **Steps**:

- Open Packet Tracer and add two computers, one switch, and one router.
- Connect the devices using Ethernet cables.
- Configure IP addresses for each device:
- Computer 1: IP Address - 192.168.1.10, Subnet Mask - 255.255.255.0
- Computer 2: IP Address - 192.168.1.11, Subnet Mask - 255.255.255.0
- Verify connectivity by pinging each computer from the other.

3. **Expected Outcome**: Both computers should successfully ping each other, confirming network connectivity.

Task 3: Assigning IP Addresses in Windows

1. **Objective**: Practice setting a device's IP address in Windows.
2. **Steps**:

- Open the Control Panel, navigate to **Network and Sharing Center**, and select **Change adapter settings**.
- Right-click on your network connection and select **Properties**.
- Select **Internet Protocol Version 4 (TCP/IPv4)** and click **Properties**.
- Choose **Use the following IP address** and enter:
- IP Address: 192.168.1.5
- Subnet Mask: 255.255.255.0
- Default Gateway: 192.168.1.1
- Save the settings and confirm that the IP has been assigned by checking it with **ipconfig** in CMD.

Task 4: Testing Connectivity Using Ping

1. **Objective**: Use the **ping** command to test network connectivity between devices.
2. **Steps**:

- Open CMD on one of the networked computers.

- Type **ping** followed by the IP address of the other computer (e.g., **ping 192.168.1.11**).
- Observe the results:
- **Reply from [IP Address]** indicates successful connectivity.
- **Request timed out** may indicate a network or configuration issue.

3. **Expected Outcome**: Successful pings show that devices are correctly configured and can communicate on the network.

6. Advanced Topics

Subnetting: Learn how subnetting divides a network into smaller segments to improve performance and security. Explore subnet masks and calculate subnets for different network classes.

MAC Address: Understand how MAC addresses identify devices on a local network and how they interact with IP addresses for data forwarding.

Troubleshooting: Learn basic troubleshooting techniques for network issues, such as connectivity tests, resetting adapters, and verifying network settings.

7. Conclusion

This lab provides students with foundational skills in understanding, configuring, and testing network components. Students gain practical knowledge of IP addressing, device roles, and network topologies, all of which are essential for managing and troubleshooting networks.

Additional Resources

- **Packet Tracer Simulation Tool**: Free software by Cisco for network simulation.
- **Network Basics Reference Guide**: Provides in-depth explanations of networking concepts.

This comprehensive lab manual introduces students to core networking concepts, preparing them for more complex topics in network management and security.

Lab 14 to 16 Manual: Network Drives and Remote Access

Objective:

The objective of this lab is to explore the configuration and usage of network drives, printer sharing, and remote access through Remote Desktop Connection (RDC). These concepts are crucial for managing shared resources, ensuring efficient collaboration, and enabling remote access to systems in modern networked environments.

Activity Outcomes:

Upon completing this lab, students will be able to:

1. Understand the purpose and benefits of network drives for centralized file storage.
2. Map a network drive, manage permissions, and demonstrate file sharing across a network.
3. Set up and share network printers, allowing multiple users to access printing resources.
4. Use Remote Desktop Connection to access and control another computer over the network.

1. Introduction to Network Drives

What is a Network Drive?

A network drive is a storage device located on a server or another computer that is accessible by other devices over a network. Network drives are used for centralized file storage, which simplifies data sharing, management, and backup processes across multiple users and devices.

Benefits of Network Drives:

- **Centralized Storage:** Allows for organized, accessible file storage in one location.
- **File Sharing:** Enables easy sharing and collaboration among multiple users.
- **Backup Management:** Simplifies data backup, reducing the risk of data loss.

- **Storage Efficiency:** Reduces the need for individual devices to have high storage capacity.

2. Network Drive Mapping

Mapping a Network Drive

Mapping a Network Drive refers to creating a shortcut on a local computer to a shared folder located on another device. This makes the shared folder appear as a drive on the user's computer, allowing for seamless access to shared files.

Steps to Map a Network Drive in Windows:

1. Open File Explorer and go to **This PC**.
2. Click on **Map network drive** in the top menu.
3. Choose a drive letter (e.g., **Z:**) that will be used to reference the mapped network drive.
4. Enter the network path of the shared folder:

- Example: **\\ServerName\SharedFolder**

5. If needed, check **Reconnect at sign-in** to automatically connect to the drive each time you log in.
6. Enter network credentials if prompted.
7. Click **Finish** to complete the mapping.

Verifying the Network Drive

After mapping, the network drive will appear under **This PC** with the assigned drive letter. Open the mapped drive to confirm you have access to its contents. You should be able to read, write, and manage files if permissions are correctly set.

3. Managing Permissions on Network Drives

Setting Permissions:

Permissions control access to files and folders on the network drive. Common permission types include Read, Write, and Modify access, which can be assigned to specific users or groups.

Steps to Set Permissions:

1. Right-click on the shared folder and select **Properties**.
2. Go to the **Sharing** tab and click **Advanced Sharing**.
3. Enable **Share this folder** and click **Permissions**.
4. Add or select users/groups and assign appropriate permissions:

- **Read:** Allows viewing and reading of files.
- **Change:** Allows editing and deleting files.
- **Full Control:** Grants complete access, including permission changes.

5. Click **Apply** and **OK** to save the permissions.

Example Scenario:

Setting permissions so only the “Sales” group can read and write to a folder ensures controlled access, preventing unauthorized modifications.

4. Printer Installation and Sharing on a Network

Installing a Network Printer:

Network Printers can be shared over a network, allowing multiple users to access a single printer. This is useful in offices or labs where several users need to print but individual printers for each user are impractical.

Steps to Install a Network Printer:

1. Open **Settings** and go to **Devices > Printers & scanners**.
2. Select **Add a printer or scanner**.
3. Choose **The printer that I want isn’t listed**.
4. Select **Add a printer using a TCP/IP address or hostname**.

5. Enter the IP address of the network printer and click **Next**.
6. Follow prompts to install any necessary drivers.

Sharing a Printer:

1. Right-click on the installed printer in **Devices and Printers** and select **Printer properties**.
2. Go to the **Sharing** tab.
3. Enable **Share this printer** and provide a Share name for the printer.
4. Click **Apply** and **OK** to allow other network users to find and add this printer.

Adding a Shared Printer on Another Computer:

1. Open **Settings > Devices > Printers & scanners**.
2. Click **Add a printer or scanner**.
3. Select **The printer that I want isn't listed**.
4. Choose **Select a shared printer by name** and enter the network path (e.g., **\\Computer Name\PrinterName**).
5. Click **Next** to add the printer.

5. Remote Desktop Connection (RDC)

Setting Up RDC on the Host Computer:

1. Open **Settings** and go to **System > Remote Desktop**.
2. Enable **Remote Desktop** and confirm the prompt.
3. Take note of the computer's name under **How to connect to this PC for remote access**.

Connecting to a Remote Computer Using RDC:

1. Open **Remote Desktop Connection** (type **mstsc** in the Run dialog or search in the Start menu).

2. Enter the computer name or IP address of the host computer.
3. Click **Connect** and enter your credentials.
4. The host computer's desktop will appear, allowing you to control it as if you were physically present.

Security Tip:

Use strong passwords and consider limiting RDC access to specific users for added security.

6. Lab Tasks and Activities

Task 1: Mapping a Network Drive and Managing Permissions

Objective: Map a network drive and configure permissions. Steps:

1. Follow the steps in Section 2 to map a shared folder on a designated computer.
2. Verify that the mapped drive is accessible and appears in **This PC**.
3. Configure permissions on the shared folder to restrict access to specific users.

Task 2: Installing and Sharing a Network Printer

Objective: Set up a network printer and enable printer sharing. Steps:

1. Follow the steps in Section 4 to add a network printer using its IP address.
2. Share the printer and set permissions to allow access for network users.
3. On another computer, add the shared printer using its network path and print a test page to confirm connectivity.

Task 3: Establishing a Remote Desktop Connection

Objective: Use RDC to remotely control another computer. Steps:

1. Enable Remote Desktop on the host computer, noting the computer name or IP address.
2. On a client computer, open Remote Desktop Connection and connect using the computer name or IP.

3. Log in with authorized credentials and verify that you have control over the remote desktop.

Troubleshooting Connection Issues:

If RDC fails to connect, check firewall settings and ensure RDC is enabled on the host.

7. Troubleshooting Common Network Drive and RDC Issues

Unable to Access Network Drive:

- Check permissions and confirm the shared folder path.
- Verify network connectivity and ensure the host computer is online.

Printer Connection Fails:

- Ensure the printer is correctly shared and the computer is on the network.
- Check drivers and re-install if needed.

Remote Desktop Fails to Connect:

- Confirm that RDC is enabled on the host.
- Verify the computer's IP address and ensure network connectivity.
- Check firewall settings, as they may block RDC.

8. Conclusion

Through this lab, students gain hands-on experience in configuring and utilizing network drives, shared printers, and remote desktop connections. These skills are essential for managing shared resources and enabling remote work environments.

Additional Resources

- **Windows Network Drive Mapping Guide**

- **Remote Desktop Troubleshooting** This lab prepares students for practical applications in network management, particularly for resource sharing and remote access in business and IT environments.