NFC-IET UNIVERSITY, MULTAN



LAB REPORT

ICT (“Information & Communication Technology Fundamental”)

For the degree of Bacheller of Science

In Computer Science

Session [2k24]

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LAB 1

**Typing Practice:**

Typing practice is a way to improve your typing speed, accuracy, and efficiency on a keyboard. It involves using various exercises, tools, and techniques to develop muscle memory and familiarity with key placements.

**Example:**

**Typing Master** is the best **software** for typing practice as it helps u to increase your typing speed.

**Internal Components of Computer:**

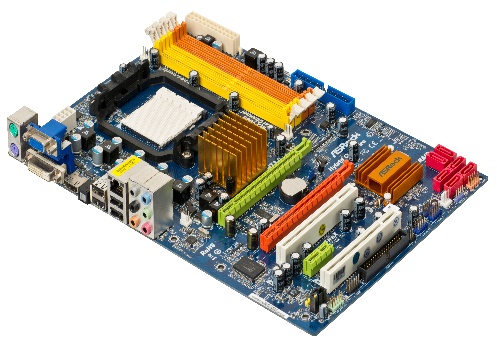
**1. Central Processing Unit (CPU)**

* **Purpose**:
* Acts as the "brain" of the computer, executing instructions and performing calculations.
* **Components:**
* **Control Unit (CU):** Directs operations of the processor.
* **Arithmetic Logic Unit (ALU):** Performs mathematical and logical operations.

****

**2. Motherboard:**

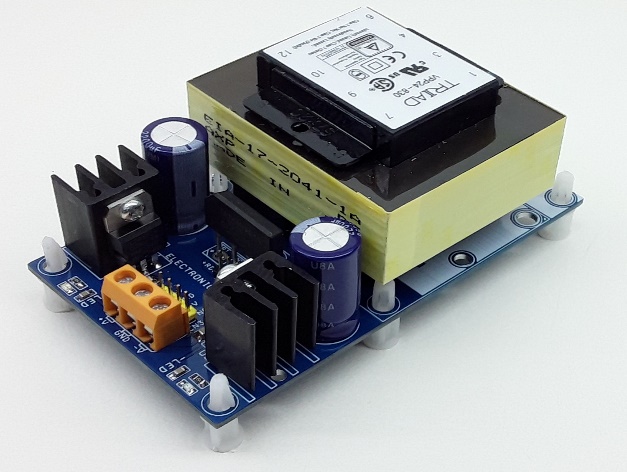
* **Purpose:**
* **The main circuit board connecting all components, allowing them to communicate.**
* **Includes: CPU socket, RAM slots, storage connectors, and expansion slots.**



[This Photo](http://commons.wikimedia.org/wiki/file:a790gxh-128m-motherboard.jpg) by Unknown Author is licensed under [CC BY-SA](https://creativecommons.org/licenses/by-sa/3.0/)

**3. Power Supply Unit (PSU):**

* **Purpose:**
* Converts electricity from an outlet into usable power for the computer’s components.
* **Feature:**
* Provides the required voltage and wattage.



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**4. Memory (RAM - Random Access Memory)**

* **Purpose:**
* Temporarily stores data and instructions currently in use by the CPU for quick access.
* **Feature:**
* Volatile memory, meaning data is lost when power is off.



[This Photo](https://tsaponar.blogspot.com/2013/05/) by Unknown Author is licensed under [CC BY-SA](https://creativecommons.org/licenses/by-sa/3.0/)

**LAB 2**

* **Windows installation Steps:**

1. **Prepare:**

* Back up your data.
* Create a bootable USB or DVD with the Windows installer.
* Ensure your PC meets Windows requirements.

1. **Boot from Installation Media:**

* Insert the USB/DVD, restart your PC, and boot from the installation media via BIOS/UEFI settings.

1. **Start Installation:**

* Select language, time, and keyboard preferences.
* Enter the product key (if you have one).

1. **Choose Installation Type:**

* **Upgrade: Keeps files/settings.**
* **Custom: Clean install on a selected partition.**

1. **Install Windows:**

* Wait for files to copy and install. Your PC will restart several times.

1. **Set Up Windows:**

* Configure region, Wi-Fi, and privacy settings.
* Log in with a Microsoft or local account.

1. **Finish Setup:**

* Update Windows, install drivers, and restore files.
  + - CPU Assembling Steps:
* **Prepare Workspace**:

Use a static-free surface and wear an anti-static wrist strap.

1. **Install CPU**:

* Open the CPU socket on the motherboard.
* Align and place the CPU (gold triangle with socket marker).
* Secure it by lowering the lever.

1. **Apply Thermal Paste**:

Add a pea-sized amount if not pre-applied on the cooler.

3. **Attach CPU Cooler**:

* Place the cooler on the CPU and secure it with screws/clips.
* Connect the fan cable to the "CPU\_FAN" header.

4. **Install RAM**:

Insert memory modules into motherboard slots.

5. **Mount Motherboard**:

Place it in the case and secure it with screws.

6. **Connect Components**:

Attach PSU cables, storage, GPU, and peripherals.

7. **Power On**:

Turn on the PSU and test the setup.

LAB 3

**Motherboard:**

The **motherboard** is the main circuit board in a computer, connecting and facilitating communication between all components. Here's an overview of its **internal structure** and key components:

* **Internal Structure of a Motherboard:**

1. **Central Processing Unit (CPU) Socket**

* **Purpose**:
  + Holds the CPU and connects it to other components.
* **Types:**
  + Vary depending on CPU brand (e.g., Intel LGA or AMD AM sockets).

1. **Chipset**

* **Purpose:** 
  + Acts as a communication hub between the CPU, memory, storage, and peripherals.
* **Components**:

**Northbridge (older motherboards):**

* + - Manages communication between the CPU, RAM, and GPU.

**Southbridge:**

* + - Manages input/output (I/O) devices, storage, and other peripherals.

1. **Memory (RAM) Slots:**

* **Purpose**:
  + Holds and connects RAM modules for temporary data storage.
* **Types**:
  + DDR3, DDR4, or DDR5 (depends on motherboard generation).

1. **Expansion Slots (PCI/PCIe)**

* **Purpose**:

Allow installation of additional cards like GPUs, sound cards, or network adapters.

* + **Types**:
    - PCIe x16 (for GPUs)
    - PCIe x1 (for smaller cards)

1. **Storage Interfaces**
   * **Purpose**:

Connect storage devices like SSDs or HDDs.

* + **Types**:
    - SATA ports (for traditional SSDs and HDDs)
    - M.2 slots (for NVMe or SATA SSDs)

1. **Power Connectors**:

* **Purpose**:
  + Distribute power from the PSU to the motherboard and components.
  + **Key Connectors**:
    - 24-pin ATX connector (main power)
    - 8-pin CPU power connector.

1. **BIOS/UEFI Chip**
   * **Purpose**:

Stores firmware for booting and hardware initialization.

1. **I/O Ports and Headers**
   * **Purpose**:

Provide connectivity for external devices.

* + **Examples**:
    - USB ports
    - Audio jacks
    - Ethernet ports
    - Display outputs (e.g., HDMI, VGA).

1. **Integrated Peripherals**

* **Purpose**:

Built-in components for specific tasks.

* Examples:
  + - Onboard audio chips for sound.
    - Network Interface Controller (NIC) for internet connectivity.

1. **Cooling System Connectors :**

* **Purpose**:

Provide power to fans and cooling systems.

Includes headers like **CPU\_FAN** and **SYS\_FAN**.

1. **Internal Buses :**

* **Purpose**:

Data pathways connecting components for communication.

Includes front-side bus (FSB), memory bus, and PCIe lanes.

1. **CMOS Battery:**

* **Purpose**:

Powers the BIOS to maintain system settings like time and date.

LAB 4

**Microsoft Office:**

**Microsoft Office** is a suite of productivity tools for creating documents, spreadsheets, presentations, and more. Here's a concise overview:

* **Main Applications:**

1. **Word:**

For text editing, document creation, templates, and collaboration tools.

1. **Excel:**

For data analysis with formulas, charts, and PivotTables.

1. **PowerPoint**:

For presentations with multimedia, animations, and templates.

1. **Outlook:**

For email, calendar, and task management.

1. **Access**:

For creating and managing databases.

1. **OneNote**:

For digital note-taking and organization.

1. **Teams**:

For communication, video conferencing, and file sharing.

* **Key Features:**
* **Cloud Integration:**

Access and sync files via OneDrive.

* **Collaboration**:

Real-time editing and sharing.

* **Templates**:

Pre-designed layouts for quick, professional results.

* **Security**:

Data encryption and password protection.

* **Automation**:

Macros and tools to save time.

* **Benefits**:

Boosts productivity, easy to use, and works across devices.

**Microsoft Word:**

**Microsoft Word** is a word processing application used for creating, editing, and formatting documents.

* **Key Features of MS Word:**

1. **Text Formatting**:
   * Customize font style, size, color, and spacing.
   * Bold, italic, underline, and strikethrough options.
2. **Paragraph Formatting**:
   * Alignment (left, center, right, justify).
   * Line spacing, indentation, and bullet/numbered lists.
3. **Styles and Themes**:
   * Predefined styles for headings, subheadings, and body text.
   * Document themes for a consistent look.
4. **Templates**:
   * Ready-made templates for resumes, letters, reports, and more.
5. **Insert Objects**:
   * Add images, shapes, charts, tables, and text boxes.
   * Insert hyperlinks, footnotes, headers, and footers.
6. **Collaboration Tools**:
   * Track changes and add comments for collaborative editing.
   * Real-time co-authoring when saved in OneDrive or SharePoint.
7. **Spelling & Grammar Check**:
   * Automatic spelling and grammar correction with suggestions.
   * Thesaurus and translation tools.
8. **Table of Contents**:
   * Automatically generate a table of contents based on document headings.
9. **Review and Editing Tools**:
   * Track changes and accept/reject edits.
   * Compare and merge documents.
10. **Mail Merge**:
    * Create personalized letters, labels, or envelopes by merging data from a spreadsheet.
11. **Cloud Integration**:
    * Save and access documents from OneDrive for online access and sharing
12. **Accessibility Features**:
    * Read aloud, dictation, and translation tools.
    * Accessibility checker to ensure document inclusivity.
13. **Smart Lookup**:
    * Provides definitions, Wikipedia entries, and web searches for highlighted text.

**Benefits:**

* Powerful document creation and formatting tools.
* Collaboration and cloud-based access.
* Widely compatible and professional results.

LAB 5

* 1. **Mail Merge:**
* **Purpose**:

Automates the creation of personalized documents (e.g., letters, labels) using data from an external source (like Excel).

* + **Steps**:
* **Start Mail Merge**:

Go to **Mailings > Start Mail Merge** and select the document type (e.g., Letters).

* **Select Recipients**:

Click **Select Recipients** to choose a data source (Excel file, CSV, etc.).

* **Insert Merge Fields**:

Place placeholders like name or address using **Insert Merge Field**.

* **Finish & Merge**:

Complete the merge by clicking **Finish & Merge**, then select **Print** or **Create New Document**.

* 1. **Table of Contents (TOC):**
* **Purpose**:

Automatically creates a TOC based on the headings in the document.

**Steps**:

* **Apply Heading Styles**:

Use **Heading 1**, **Heading 2**, etc., for section titles.

* **Insert TOC**:

Go to **References > Table of Contents** and choose a style.

* **Update TOC**:

After changes, right-click the TOC and select **Update Field** to reflect edits.

**3. Section Breaks:**

**Purpose**:

Divides a document into sections, allowing different formatting, headers/footers, and page numbering within the same document.

* **Types of Section Breaks**:
* **Next Page**:

Starts a new section on the next page.

* **Continuous**:

Starts a new section on the same page.

* **Odd/Even Page**:

Starts a new section on the next odd/even page.

* **Steps**:
* **Go to Layout > Breaks**, then choose the type of **Section Break**.

**4.References:**

* **Purpose**:

Adds citations, footnotes, endnotes, and bibliographies to a document.

* **Steps**:
* **Insert Citation**:

Go to **References > Citations & Bibliography**, then click **Insert Citation** and choose your source.

* **Add Footnotes/Endnotes**:

Click **Insert Footnote** or **Insert Endnote** under the **References** tab.

* **Manage Sources**:

Use **Manage Sources** to store and organize references for future use.

**5. Headers and Footers:**

* **Purpose**:

Adds content that appears at the top (header) or bottom (footer) of each page (e.g., page numbers, document title, author name).

* **Steps**:
* **Insert Header/Footer**:

Go to **Insert > Header** or **Insert > Footer**, and choose a style.

* **Edit Content**:

You can insert text, page numbers, date, or images.

* **Different Headers/Footers for Sections**:

Use **Link to Previous** to enable or disable the same header/footer across sections. To edit a specific section, uncheck **Link to Previous** under the **Header & Footer Tools** tab.

* **Page Numbering**:

Click **Page Number** under the **Insert** tab to place page numbers in headers/footers.

* **Efficient Usage Tips:**
* **Mail Merge**:

Always use an Excel spreadsheet for organizing recipient data and ensure it’s formatted properly before starting the merge.

* **TOC**:

To get the best results, consistently apply heading styles for all section titles in your document.

* **Section Breaks**:

Use them when you need different page orientations (portrait vs. landscape) or separate page numbering formats (e.g., Roman numerals for front matter, numbers for the rest).

* **References**:

Use **Source Manager** to keep a library of citations for future use, and select the correct citation style (APA, MLA, etc.) under **References > Style**.

* **Headers/Footers**:

For documents with multiple sections, ensure each section has the correct header/footer by checking the **Link to Previous** option.

**LAB 6**

### ****1. Mendeley (Reference Management and Citation Tool):****

**Purpose**:

Mendeley helps manage and organize your research papers, create citations, and generate bibliographies.

**Features**:

* **Reference Management**:

Import research papers from academic databases like Google Scholar, JSTOR, and more.

* **Citations**:

Automatically generate citations in various formats (APA, MLA, Chicago, etc.).

* **Bibliography Generation**:

Create bibliographies by selecting references in your Mendeley library.

* **Collaboration**:

Share references and documents with teams for collaborative work.

**Steps**:

1. **Install Mendeley**:

Download and install Mendeley Desktop from [Mendeley’s website](https://www.mendeley.com).

1. **Add Documents**:

Import PDFs or manually add references using the "Add Document" option.

1. **Use Mendeley with Word**:

Install the Mendeley Word Plugin to easily insert citations and generate bibliographies.

* + **Insert Citations**:

Click **References > Insert Citation** and search your Mendeley library.

* + **Generate Bibliography**:

Once all citations are added, Mendeley can create a bibliography with the **Insert Bibliography** button.

### ****2. Grammarly (Grammar and Writing Assistance):****

**Purpose**:

Grammarly helps with grammar checking, spelling correction, style improvement, and plagiarism detection.

**Features**:

* **Grammar Check**:

Checks for spelling, grammar, punctuation errors, and clarity.

* **Writing Style**:

Suggestions to improve sentence structure and readability.

* **Plagiarism Detection**:

Checks if content matches sources online.

* **Tone Detection**:

Analyzes the tone of your writing (formal, casual, etc.).

**Steps**:

1. **Install Grammarly**:

Download the Grammarly plugin for your browser, or use the desktop app.

1. **Use in Word**:

Grammarly integrates with Microsoft Word and Outlook to check grammar while you write.

1. **Proofread**:

Review suggestions in the Grammarly sidebar and accept/reject them as needed.

### ****PDF Element (PDF to Word Conversion Tool):****

**Purpose**:

PDF Element allows for PDF editing and converting PDFs into Word, Excel, PowerPoint, and more.

**Features**:

* **PDF to Word**:

Convert PDFs into editable Word documents without losing formatting.

* **Editing PDFs**:

Add, delete, or modify text and images in PDFs.

* **Form Filling**:

Fill out PDF forms and save them.

* **OCR (Optical Character Recognition)**:

Convert scanned documents into editable formats.

**Steps**:

1. **Install PDF Element**: Download and install PDF Element from Wondershare's website.
2. **Convert PDF to Word**:
   * Open the PDF in PDF Element.
   * Click on **Convert** and select **To Word**.
3. **Edit PDF**:

Use the **Edit** tab to modify text, images, or add annotations.

1. **OCR**:

If the PDF is a scanned image, use the **OCR** feature to extract editable text.

### ****4. Automating Repetitive Tasks with Macros in Word:****

**Purpose**:

Macros automate repetitive tasks in Word, saving time on tasks like formatting, text insertion, etc.

**Steps to Create a Macro**:

1. **Record a Macro**:
   * Go to **View > Macros > Record Macro**.
   * Name your macro and assign a shortcut key.
   * Perform the tasks you want to automate (e.g., formatting text, inserting headers).
2. **Stop Recording**:
   * After completing the actions, click **View > Macros > Stop Recording**.
3. **Run a Macro**:
   * To run your macro, use the shortcut key or go to **View > Macros > View Macros**, select your macro, and click **Run**.

### ****5. Referencing Tools for Citations, Footnotes, and Endnotes****

**Purpose**:

These tools help you create proper citations, footnotes, and endnotes within Word documents.

**Steps**:

* **Insert Citations**:
  1. Use **References > Citations & Bibliography** to insert citations from your selected referencing style.
  2. Click **Insert Citation** to choose or add a source.
* **Insert Footnotes/Endnotes**:
  1. Go to **References > Insert Footnote** to insert footnotes.
  2. For endnotes, click **Insert Endnote**. Both footnotes and endnotes will be numbered automatically.
* **Manage Sources**:

Use **Manage Sources** to store and edit your citations for future use in documents.

LAB 7

**1. Mail Management:**

Efficient email handling is critical for productivity. Here are some tips and tools:

**Key Features & Best Practices**

* **Folder Organization:**
  + Use folders or labels to categorize emails (e.g., by project, client, or urgency).
  + Automate email sorting using rules or filters.
* **Search & Archive:**
  + Leverage search tools to quickly locate old emails.
  + Archive emails that are not immediately needed but must be retained.
* **Flags & Reminders:**
  + Use flags or stars to highlight important emails.
  + Set reminders for emails requiring a response or follow-up.
* **Unsubscribe & Declutter:**
  + Regularly unsubscribe from irrelevant mailing lists.
  + Use tools like Clean Email or Unroll.me to manage subscriptions.
* **Unified Inbox:**
  + Use apps that consolidate multiple email accounts (e.g., Outlook, Thunderbird).

**Popular Tools for Mail Management:**

* **Microsoft Outlook:**
* Includes rules, categories, and a focused inbox for prioritizing emails.
* **Gmail:**
* Offers smart filters, labels, and AI-driven priority inbox.
* **Spark:**
* A collaborative email app that supports team discussions within emails.

**2. Collaborative Tools:**

Collaborative platforms enhance teamwork, especially for remote or hybrid settings.

**Key Features:**

* **Track Changes & Comments:**
  + Enable "Track Changes" to show edits made by collaborators.
  + Add comments for clarification, suggestions, or discussions directly within the document.
* **Real-Time Collaboration:**
  + Use tools that allow multiple users to work simultaneously.
  + Ensure version history is enabled for tracking progress.
* **Task Assignments:**
  + Assign tasks or portions of a project within the document itself (e.g., in Google Docs or Microsoft Word).

**Popular Tools for Collaboration:**

* **Microsoft 365 (Word, Excel, PowerPoint):**
* Offers robust commenting, change tracking, and versioning features.
  + **Google Workspace (Docs, Sheets, Slides):**
* Known for real-time collaboration and ease of sharing.
  + **Notion/Click Up:**
* Combines documents with project management features.

1. **Document Protection:**

Safeguarding sensitive information is essential, especially when sharing documents.

**Key Features:**

* **Password Protection:**
  + Set strong passwords for documents (e.g., in Microsoft Word or Adobe Acrobat).
* **Editing Permissions:**
  + Restrict access to view-only, comment-only, or full editing rights.
  + Use "share with specific users" rather than public links.
* **Watermarking:**
  + Add watermarks to prevent unauthorized distribution or copying.
* **Track Changes During Reviews:**
  + Ensure all edits are visible for accountability.
  + Lock certain sections from editing if necessary.

**Tools for Protection:**

* + **Microsoft Office Suite:**
* Password-protect documents and control editing permissions.
  + **Adobe Acrobat:**
* Provides advanced PDF protection features like encryption and restricted access.
  + **Google Drive:**
* Allows sharing controls, such as expiry dates for access links.

**Mastering Reviewing and Comparing Documents:**

* Use **Microsoft Word** or **Adobe Acrobat** to compare two versions of a document, highlighting differences.
* **In Microsoft Word:**
  + Go to **Review** > **Compare** > Choose documents to compare.
* **In Adobe Acrobat:**
  + Use **Compare Files** for PDFs, highlighting changes between versions.

LAB 8

**📊 Excel Essentials Guide**

**Master Excel Skills for Data Management and Analysis**

**1. 🌟 Getting Started with Excel:**

**🔸 What is Excel?**

* A spreadsheet tool used for data entry, analysis, and visualization.

**🔸 Key Excel Elements**

* **Workbook & Worksheets:**

Files with multiple sheets.

* **Excel Interface:**

Ribbon, Quick Access Toolbar, Formula Bar, and Status Bar.

**🔸 Basic Actions**

* **Create a New Workbook:**

File → New → Blank Workbook

* **Save Your Work:**

File → Save As

**📸 Suggested Picture:**

Screenshot showing Excel's interface with key areas labeled.

**2. 📐 Intermediate Formulas & Functions**

**🔹 Working with Multiple Worksheets:**

* **Add/Delete Sheets:**

Click "+" or right-click tab → "Delete"

* **Rename Sheets:**

Double-click the tab name.

* **Link Data Across Sheets:**

Use =Sheet2!A1 in formulas.

**📸 Suggested Picture:**

Example of linked worksheets referencing data.

**🔹 Key Excel Functions:**

**🔹 Key Excel Functions:**

|  |  |  |
| --- | --- | --- |
| **Function** | **Description** | **Example** |
| **=MIN(range)** | **Finds the smallest value** | **=MIN(A1:A10)** |
| **=MAX(range)** | **Finds the largest value** | **=MAX(A1:A10)** |
| **=COUNT(range)** | **Counts numbers only** | **=COUNT(A1:A10)** |
| **=IF(condition, true, false)** | **Conditional check** | **=IF(A1>50, "Pass", "Fail")** |

**📸 Suggested Picture:**

Excel table with formulas applied, showing results.

**3. 🔗 Cell Referencing Basics:**

**🔹 Types of Cell Referencing:**

1. **Relative Referencing:**
   * Adjusts automatically when copied.

* Example:

=A1+B1

1. **Absolute Referencing:**
   * Fixed using $ symbol.

* Example:

=$A$1+$B$1

1. **Mixed Referencing:**
   * Combines both methods.

* Example:

=$A1+B$1

**📸 Suggested Picture:**

Visual showing the effect of copying formulas with different referencing types.

**4.📋 Sorting & Filtering Data:**

**🔹 Sorting Data**

* **Steps to Sort:**
  + Select your data range.
  + Click **Data → Sort**.
  + Choose columns, sort by ascending/descending.

**🔹 Filtering Data:**

* **Steps to Filter:**
  + Select data range.
  + Click **Data → Filter**.
  + Use drop-down arrows to filter specific values.

**📸 Suggested Picture:**

Data being sorted and filtered in Excel, with dialogs highlighted.

LAB 9

**1. 📈 Creating Charts and Graphs:**

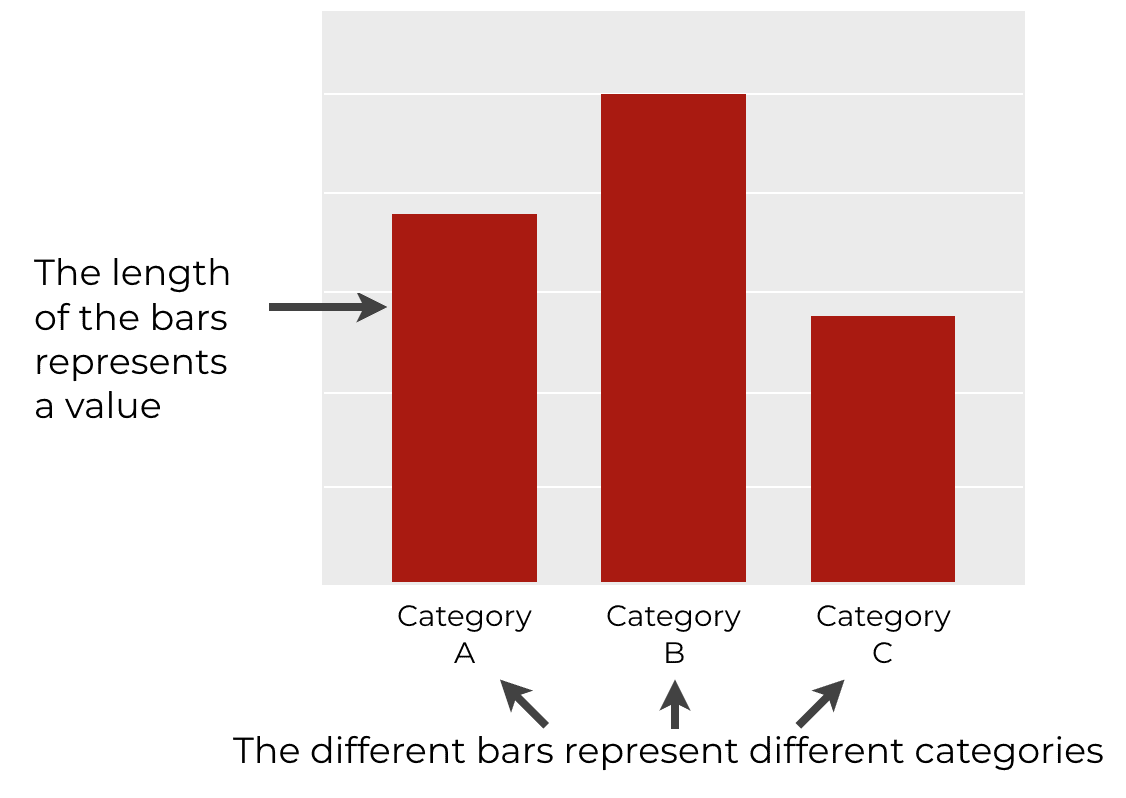
**🔹 Why Use Charts?**

* Make data easier to interpret.
* Identify trends, patterns, and comparisons visually.

**📊 Popular Excel Chart Types:**

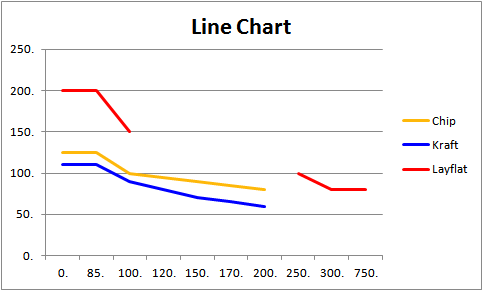
1. **Bar Chart:**

Compare categories side by side.



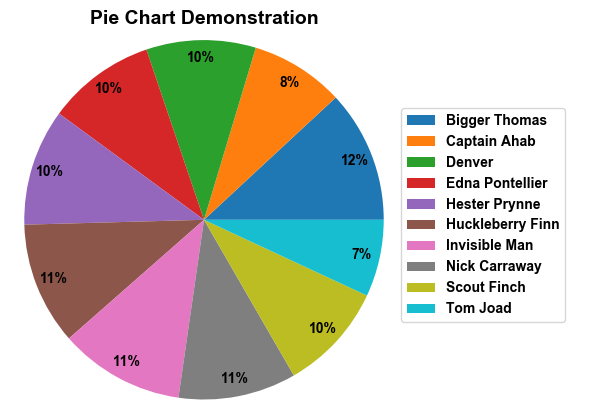
1. **Line Chart:**

Show trends over time.



1. **Pie Chart:**

Display proportions as slices of a circle.



**📋 How to Create a Chart:**

1. Select your data range.
2. Click **Insert → Charts** from the Ribbon.
3. Choose your chart type (Bar, Line, Pie).
4. Customize titles, legends, and labels.

**💡 Pro Tip:**

**Use the Chart Design tab for custom styles and layouts.**

**📸 Suggested Visual:**

Examples of different Excel charts created from sample data.

**2. 🎨 Conditional Formatting:**

**🔹 What Is Conditional Formatting?**

Highlight important data visually by applying colors, icons, or bars based on conditions.

**📋 How to Apply Conditional Formatting:**

1. Select the data range.
2. Go to **Home → Conditional Formatting**.
3. Choose a rule (e.g., "Highlight Cells Greater Than").
4. Set your desired formatting style (color, bold text, data bars, or icons).

**Example Rules:**

* **Sales Targets:**

Highlight sales over $5,000 in green.

* **Top Performers:**

Use color scales to indicate performance.

**📸 Suggested Visual:**

A spreadsheet with applied conditional formatting showing color-coded cells.

**3. 🏷️ Creating Barcodes and QR Codes:**

**🔹 Why Use Barcodes and QR Codes?**

* Automate product tracking, inventory management, or event registration.

**📋 How to Create Barcodes and QR Codes:**

1. **For Barcodes:**
   * Install **Code 39 Font** or similar.
   * Enter the product ID and apply the barcode font.



1. **For QR Codes:**
   * Go to **Insert → Get Add-ins**.
   * Search and install **QR4Office**.
   * Generate QR codes by entering data directly.



**💡 Pro Tip:**

Use QR codes for product details, web links, and contact info!

**📸 Suggested Visual:**

Generated barcodes and QR codes with example labels.

**4. 📋 Working with Tables and Data Validation:**

**🔹 Why Use Tables?**

* Organize and format data efficiently.
* Enable filtering, sorting, and automatic formulas.

**📋 How to Create a Table:**

1. Select the data range.
2. Click **Insert → Table**.
3. Check “Table has headers” if applicable.

**🔹 Applying Data Validation:**

* Ensure only specific types of data are entered.

**📋 Steps:**

1. Select the target cells.
2. Go to **Data → Data Validation**.
3. Choose the validation type (e.g., list, whole number, or date).
4. Customize the error message if needed.

* **Example Use Cases:**
* **Dropdown Menus:**

Create dropdown lists for selection.

* **Input Restrictions:**

Limit age to numbers between 18-60.

**📸 Suggested Visual:**

A well-formatted Excel table with dropdown lists and data validation alerts.

**5. 📊 Statistical Analysis Functions:**

**🔹 Why Use Statistical Functions?**

* Perform data analysis and generate insights quickly.

**📋 Key Excel Statistical Functions:**

|  |  |  |
| --- | --- | --- |
| **Function** | **What It Does** | **Example** |
| =AVERAGE(range) | Calculates the average value. | =AVERAGE(A1:A10) |
| =MEDIAN(range) | Finds the middle value. | =MEDIAN(A1:A10) |
| =MODE.SNGL(range) | Returns the most common value. | =MODE.SNGL(A1:A10) |
| =STDEV.P(range) | Standard deviation (pop.). | =STDEV.P(A1:A10) |
| =VAR.P(range) | Variance of a population. | =VAR.P(A1:A10) |
| =COUNTIF(range,criteria) | Counts values matching criteria. | =COUNTIF(A1:A10, ">50") |

**6. 📊 Frequency Function for Data Analysis:**

**🔹 Why Use the FREQUENCY Function?**

* Analyze how often specific values appear in a dataset.

**📋 How to Use FREQUENCY Function:**

1. Enter data values in **A2:A11** (e.g., exam scores).
2. Define intervals (bins) in **B2:B5** (e.g., 0-50, 51-70, etc.).
3. Use this array formula (Ctrl + Shift + Enter):

=FREQUENCY(A2:A11, B2:B5):

**Result:**

The result shows how many scores fall within each bin range.

**📸 Suggested Visual:**

A table showing score frequency analysis with bins and corresponding results.

LAB 10

**📊 Advanced Tools and Final Project in Excel:**

**1. 📋 Introduction to Pivot Tables**

**🔹 Why Use Pivot Tables?**

* Summarize, analyze, and explore data quickly.
* Create customized reports without altering the original data.

**📋 How to Create a Pivot Table:**

1. Select your data range.
2. Go to **Insert → Pivot Table**.
3. Choose where to place the table (New/Existing worksheet).
4. Drag fields to **Rows**, **Columns**, **Values**, and **Filters**.

**Example Use Case:**

* **Sales Report Analysis:** Summarize total sales by month, region, or product.

**📸 Suggested Visual:**

A Pivot Table summarizing monthly sales with categories and totals.

**2. 🔍 Using VLOOKUP and HLOOKUP:**

**🔹 What Are VLOOKUP and HLOOKUP?**

* **VLOOKUP:** Finds data vertically in a column.
* **HLOOKUP:** Searches horizontally in a row.

**📋 VLOOKUP Syntax:**

* excel
* Copy code

=VLOOKUP(lookup\_value, table\_array, col\_index\_num, [range\_lookup])

**Example:**  
Find a product's price from a product list:

|  |  |
| --- | --- |
| **Product** | **Price ($)** |
| Laptop | 1000 |
| Phone | 800 |

**Formula:**

=VLOOKUP("Laptop", A2:B4, 2, FALSE)

**Result:** $1000

**📋 HLOOKUP Syntax:**

=HLOOKUP(lookup\_value, table\_array, row\_index\_num, [range\_lookup])

**Example:**  
Find the sales in **March** from a table:

|  |  |  |  |
| --- | --- | --- | --- |
| **Month** | **January** | **February** | **March** |
| Sales ($) | 5000 | 7000 | 6500 |

**Formula:**

=HLOOKUP("March", A1:D2, 2, FALSE)

**Result:**

$6500

**📸 Suggested Visual:**

Tables with sample lookup results displayed.

**3. 🏗️ Introduction to Macros:**

**🔹 Why Use Macros?**

* Automate repetitive tasks.
* Increase productivity and reduce manual errors.

**📋 How to Create a Macro:**

1. Go to **Developer → Record Macro**.
2. Name the macro and choose where to store it.
3. Perform the actions you want Excel to record.
4. Click **Stop Recording**.

**Running a Macro:**

* Use **Alt + F8** or assign the macro to a button.

**💡 Example Task Automation:**

* Format a report automatically (adjust font, add headers, apply styles).

**📸 Suggested Visual:** Macro recording window with a task being automated.

1. **📊 Final Project: Analyze and Visualize Data Set:**

**🔹 Project Goal:**

Use the skills learned throughout the course to analyze and visualize a real-world dataset.

**💡 Project Idea:**

**Sales Data Analysis Project:**

1. **Data Source:**

Use sales data (products, prices, regions, and sales amounts).

1. **Tasks:**
   * Create a **Pivot Table** summarizing sales by region.
   * Use **VLOOKUP** to fetch product details.
   * Apply **Conditional Formatting** to highlight high sales.
   * Generate **Charts**: Bar, Line, and Pie Charts.
   * Create a **Dashboard** combining Pivot Tables and Charts.
   * Automate report generation with **Macros**.

**📸 Suggested Visual:**

A dashboard showing sales analysis with pivot tables, charts, and lookup results.

**PRACTICAL WORK OF MS WORD FEATURES PERFORMED IN LAB**

**Home 🡪 create a new document , Recent and pinned projects**

**New🡪 ctrl +N (for new blank document)**

**Open 🡪 ctrl + O (opening a new document)**

**Info 🡪 (tells us about privacy related to created document)**

**Save 🡪 ctrl +S (saving document)**

**Save as 🡪 ctrl +S (saving document)**

**Print 🡪 ctrl +P (for printing a document)**

**Share 🡪 (for sharing a document)**

**Export🡪 Export as PDF**

**Close 🡪 for closing document and this time saving name of document by default appears**

**More 🡪 Account and other options**

**Microsoft Word (Home Menu)**

**First Group : Clipboard**

**Cut 🡪 ctrl + X (to cut a text)**

**Copy 🡪 ctrl + C (to copy the text)**

**Past 🡪 ctrl + V**

**Format Painter 🡪 we can** format **text**

**Second Group :** Font

Clear formatting

Bold 🡪 **ctrl + B**

Underline 🡪 **ctrl + U and**

Italic 🡪 ***ctrl + I***

Font style🡪**(you are the one )**

**Font size 🡪 Me**

Strikethrough🡪~~delete~~

Superscript and subscript 🡪 x12 x12

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Student Details | | | | |
| Roll # | Name | Class | section | marks |
|  |  |  |  |  |
|  | kinza | ict | y | 997 |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

**THIRD Group 🡪Paragraph**

* Left Alignment 🡪ctrl + L
* Right Alignment 🡪 ctrl + R
* centered 🡪 ctrl + E
* justified 🡪 ctrl + J

**Alignment :**

it is difficult to do but its ok as we can do it and I wo should remember to do our work on time and with extra efforts and fully concentration . Lab work is really very exciting and entertaining.

**Bullets :**

* Left Alignment 🡪ctrl + L
* Right Alignment 🡪 ctrl + R
* centered 🡪 ctrl + E
* justified 🡪 ctrl + J

**Numbering :**

1. tree
2. grass
3. fruits

**Sorting :**

**Drum**

**Guitar**

**Piano**

Line Spacing :

**Try try again till you succeed**

**You are the one**

Editing :

1. find
2. replace
3. select

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| December | | | | | | |
| M | T | W | T | F | S | S |
|  |  |  |  |  |  | 1 |
| 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| 16 | 17 | 18 | 19 | 20 | 21 | 22 |
| 23 | 24 | 25 | 26 | 27 | 28 | 29 |
| 30 | 31 |  |  |  |  |  |
|  |  |  |  |  |  |  |

<../Pictures/Saved%20Pictures/>

[../Pictures/Saved%20Pictures/](https://d.docs.live.net/b2ea8cb59c64e86a/Pictures/Saved%20Pictures/)

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[](.)

[#December](#december) 🡪 bookmark link

fruits 🡪 cross reference

fruits

**for random paragraph insert**

=rand(n)

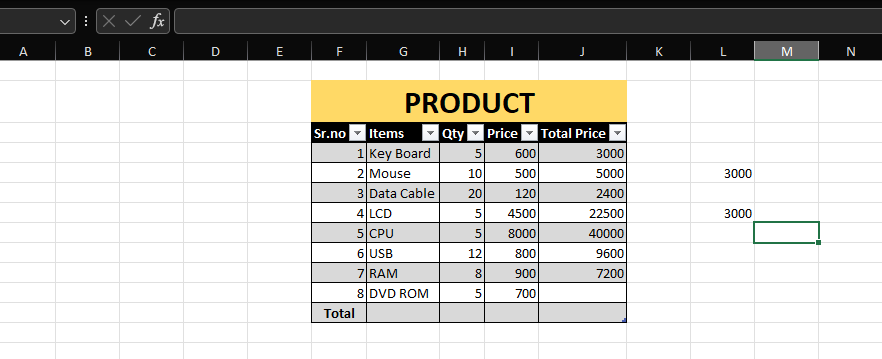
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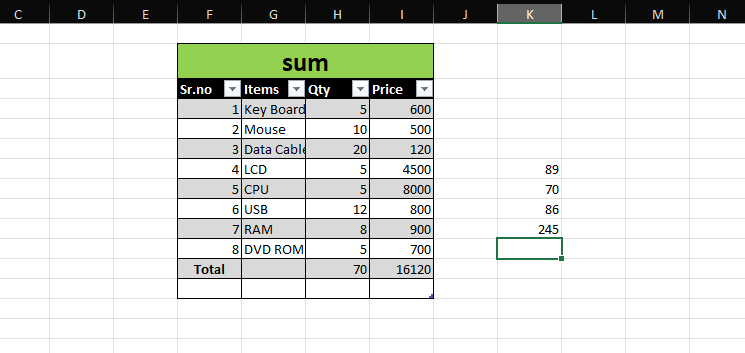
To make your document look professionally produced, Word provides header, footer, cover page, and text box designs that complement each other. For example, you can add a matching cover page, header, and sidebar. Click Insert and then choose the elements you want from the different galleries.

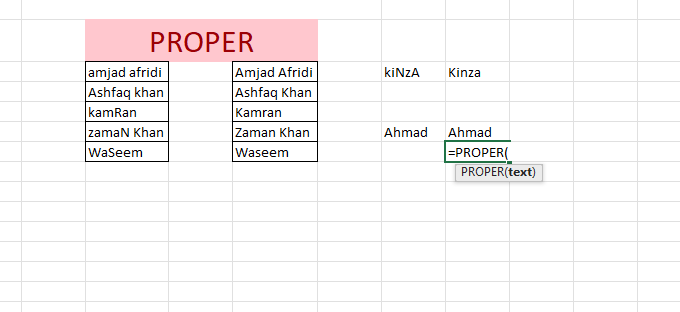
14 October 2024

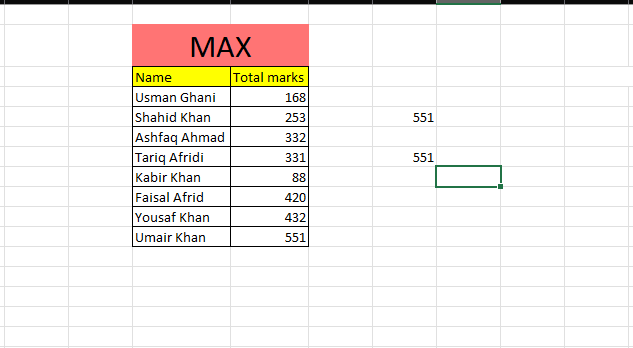


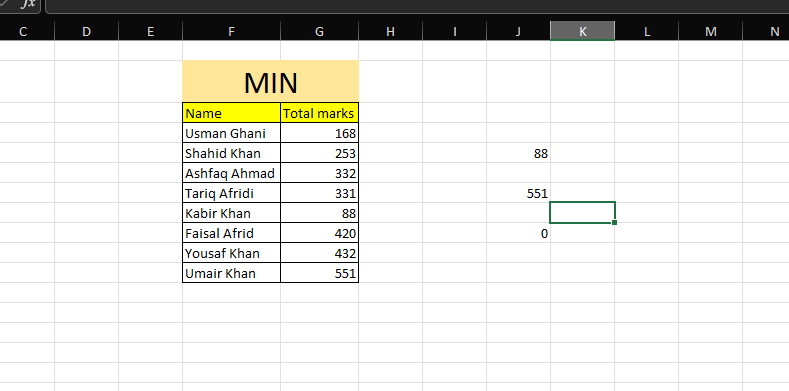
**Excel Work Practice**

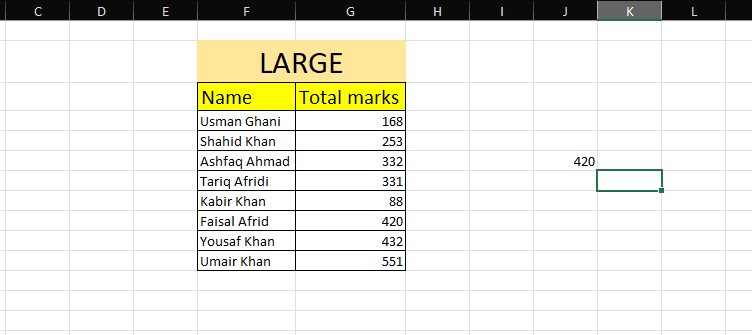


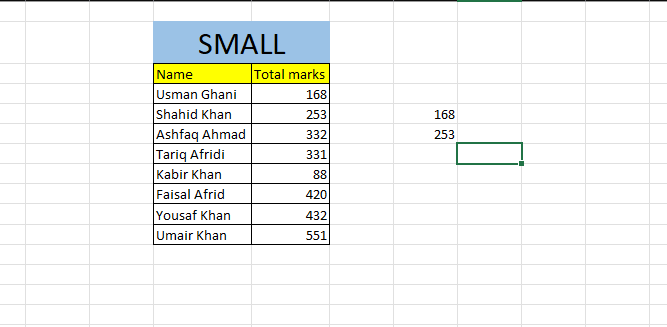


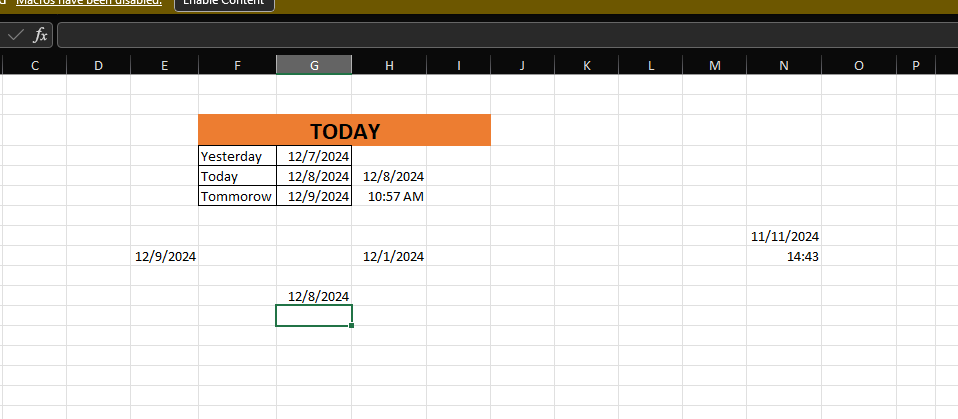


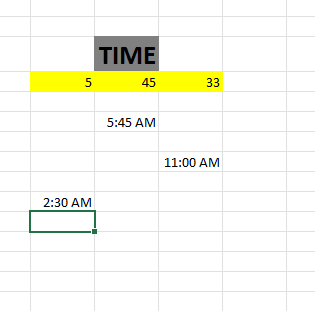


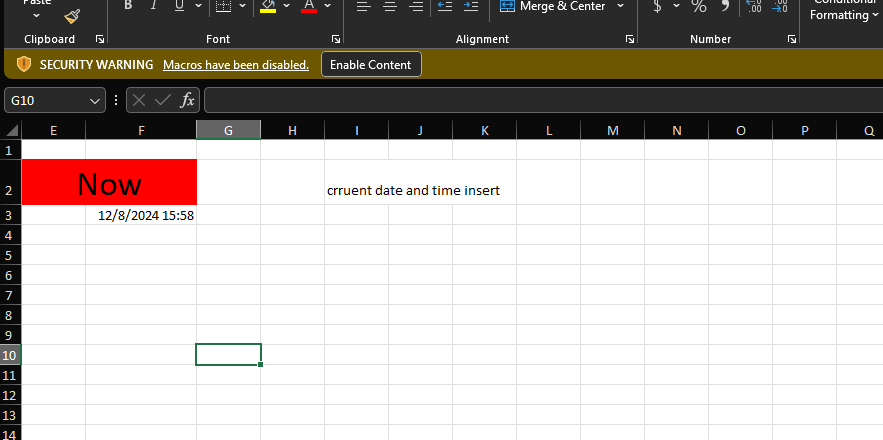


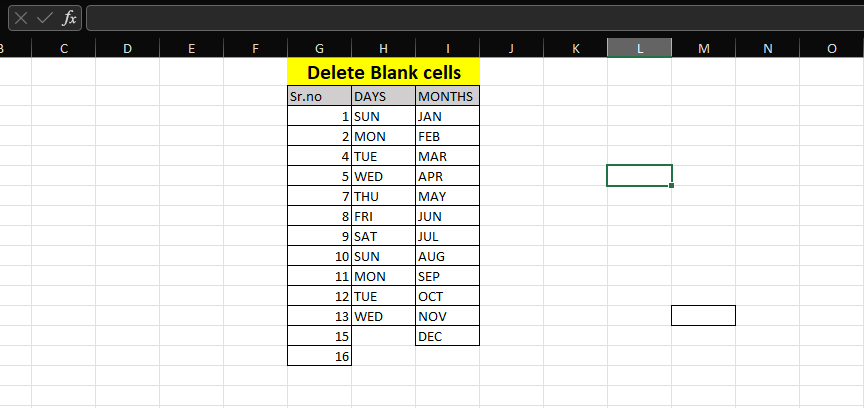


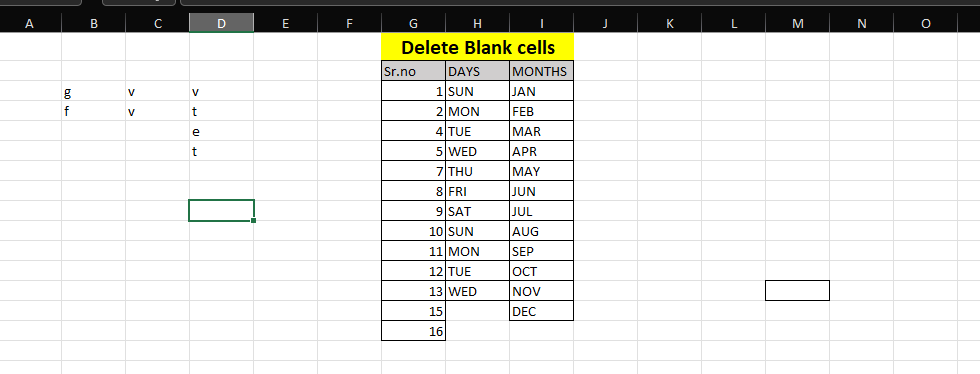


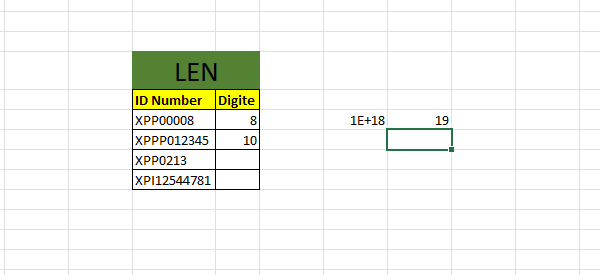


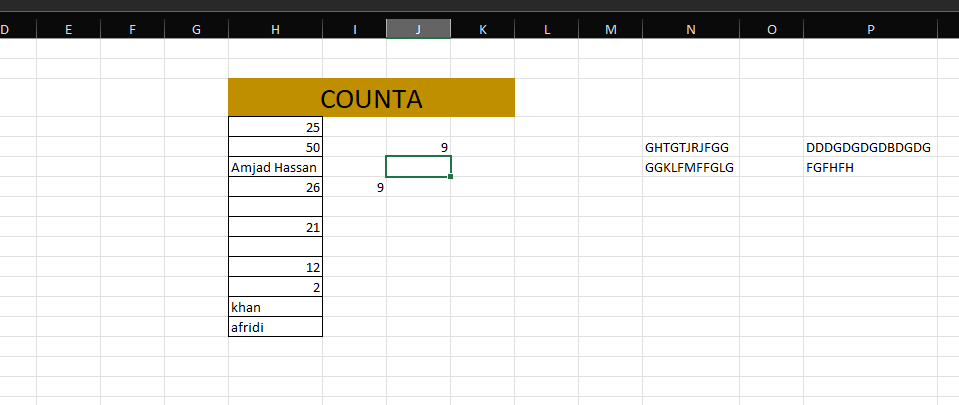


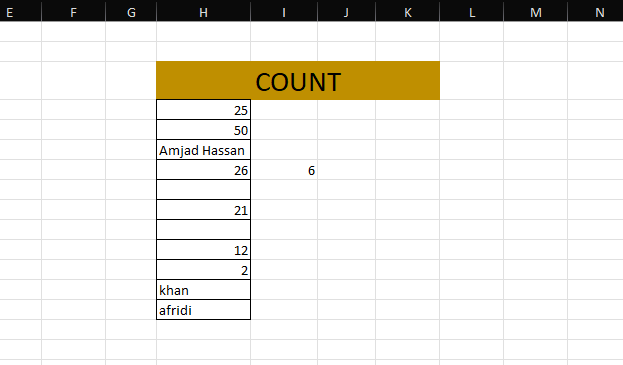


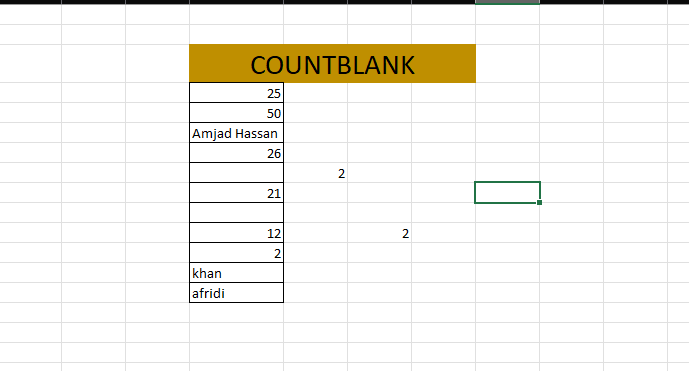




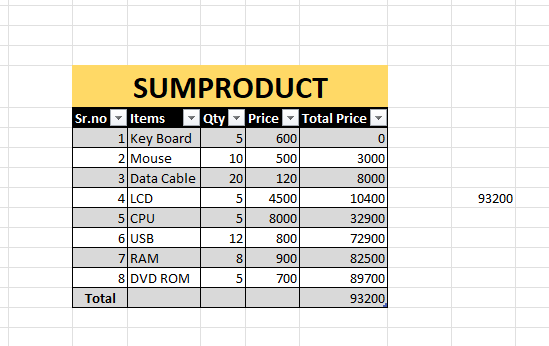


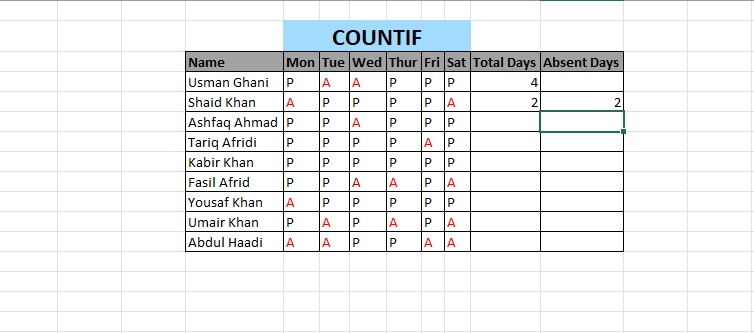


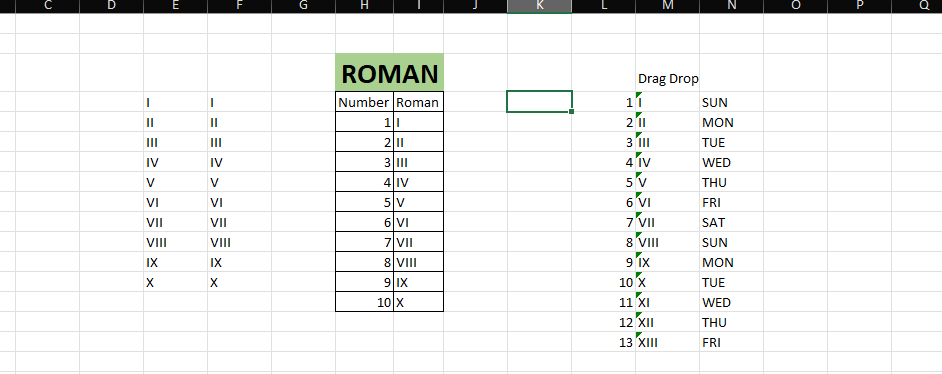


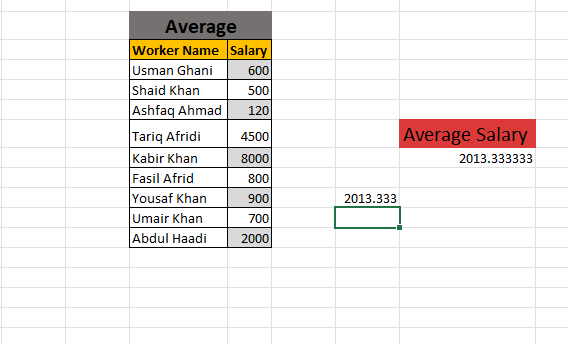


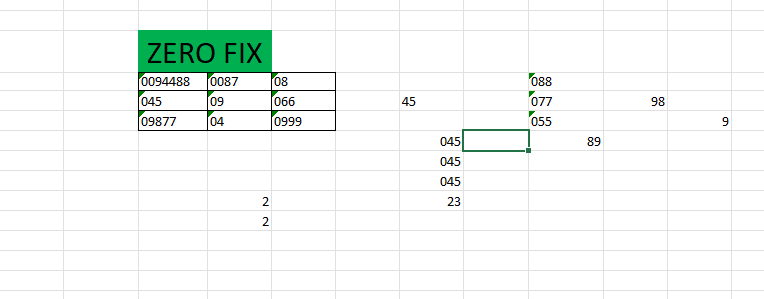


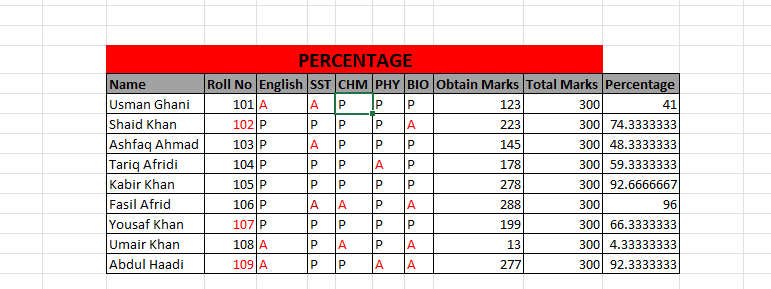


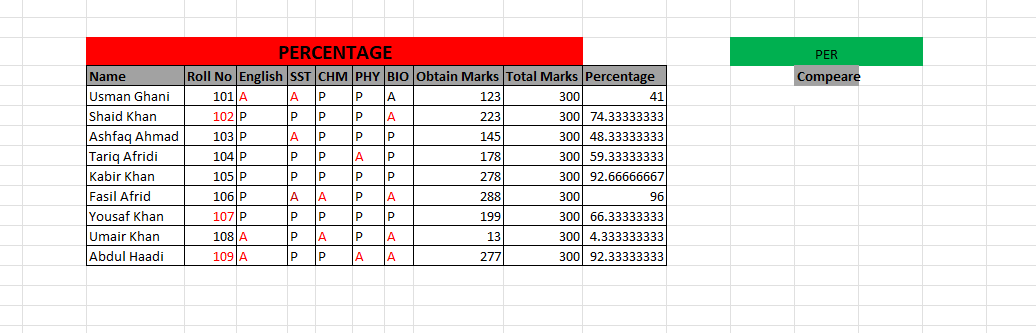


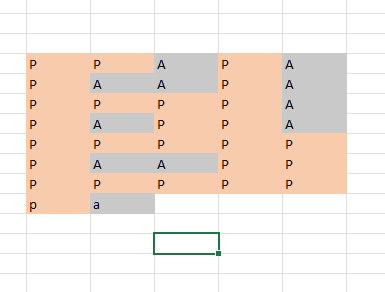


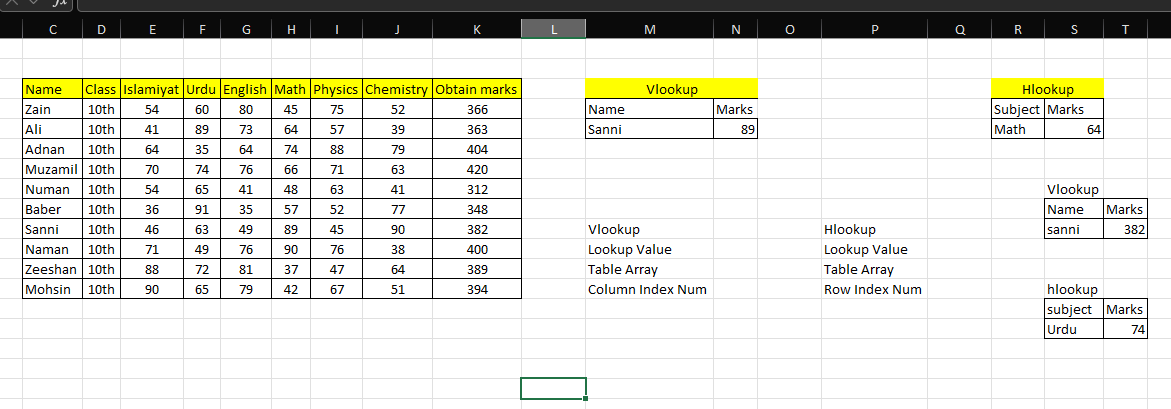


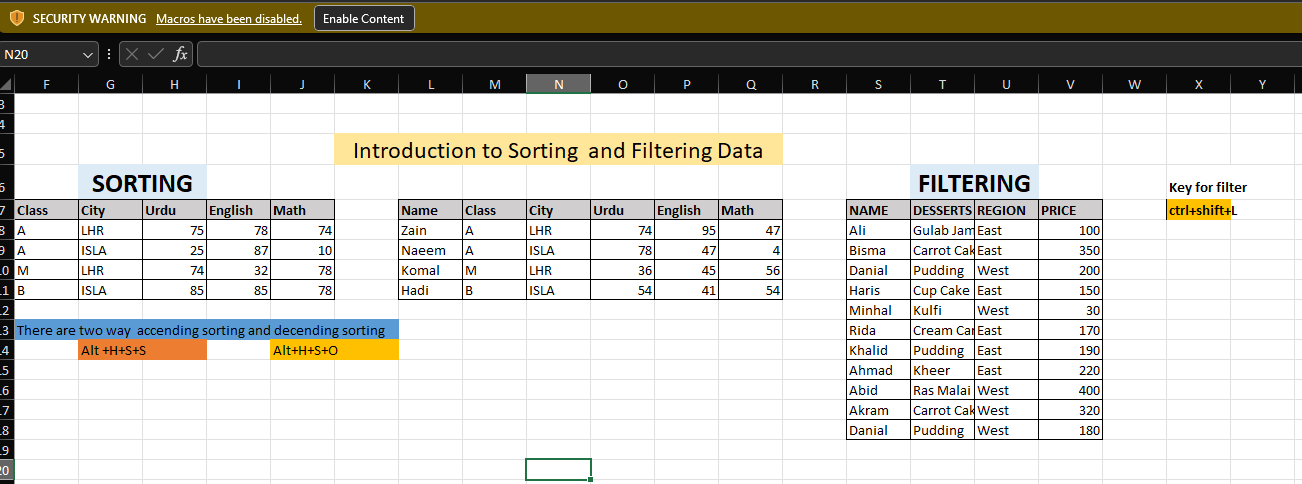


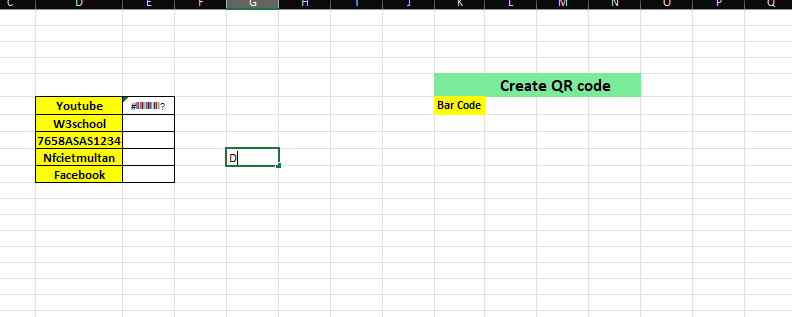


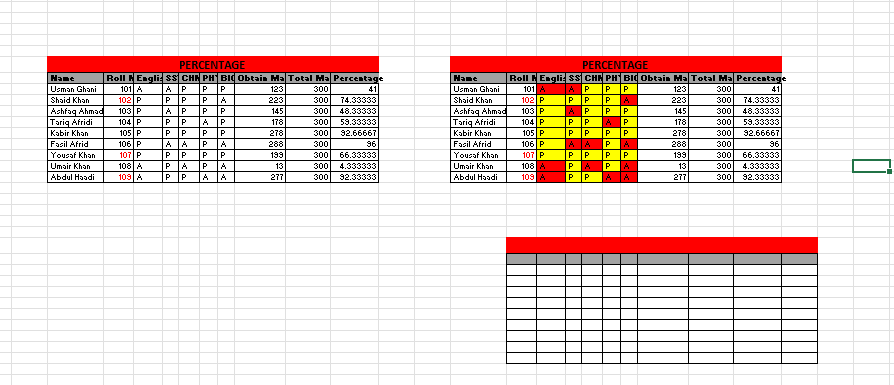


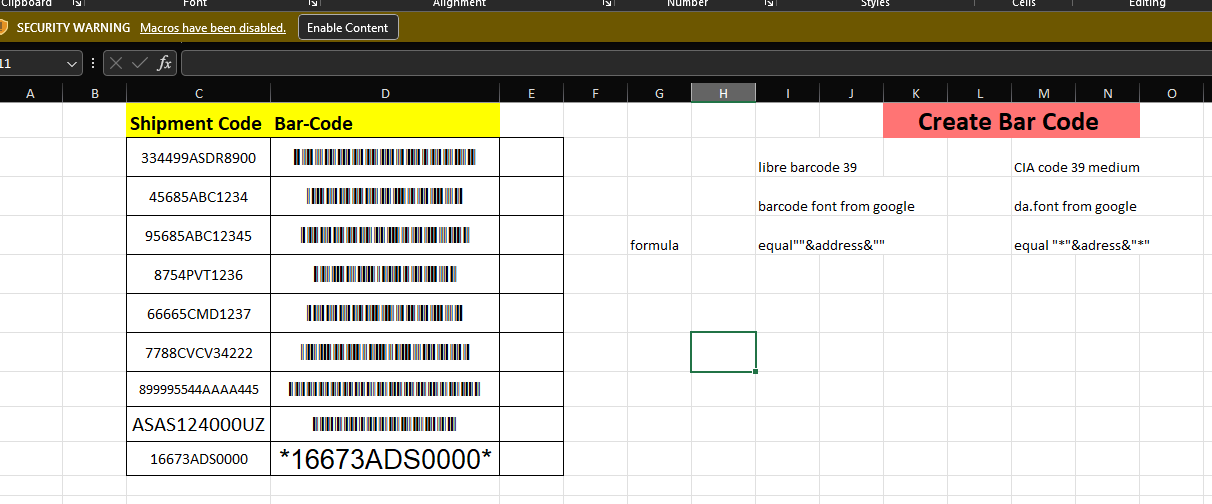


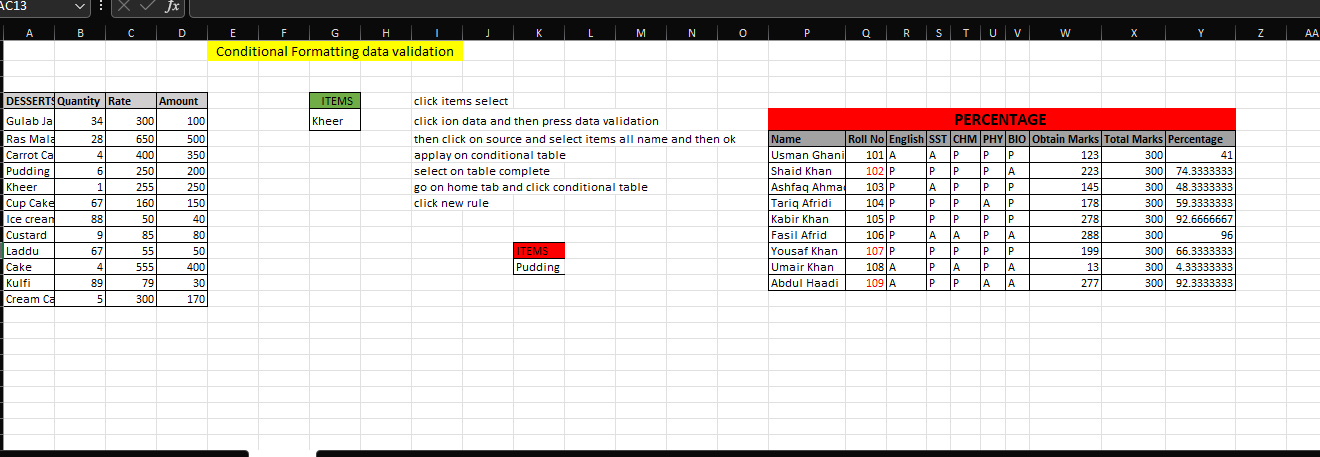


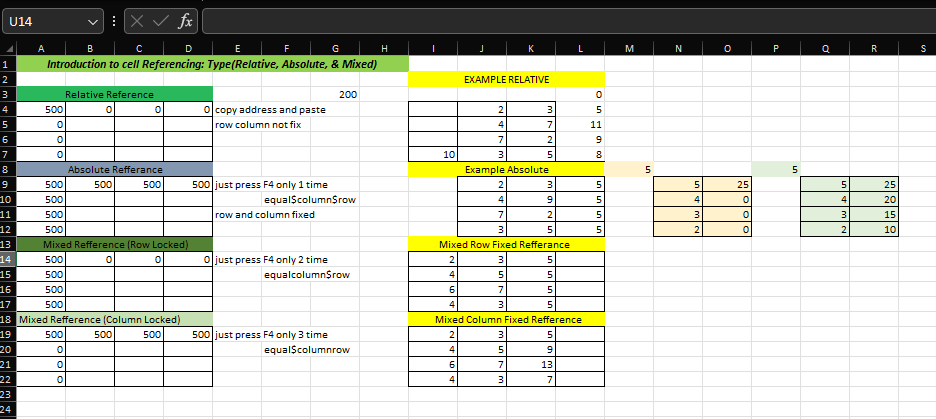




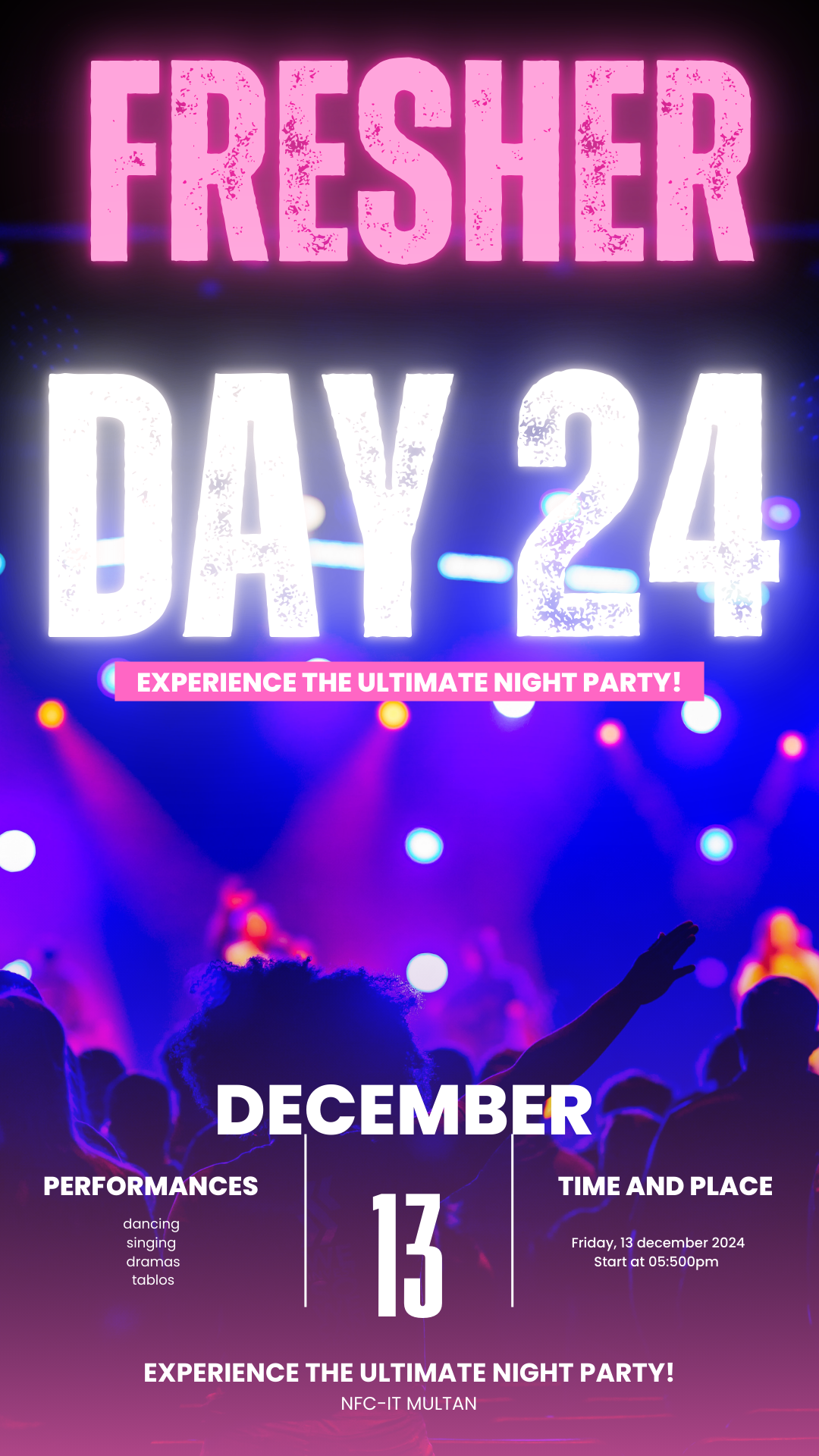








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