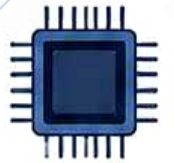
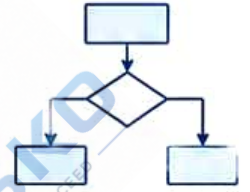
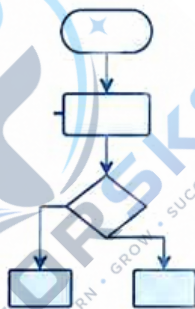


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ONLINE PROCESSING



Real-time Data Processing for Instant Results

WHAT IS ONLINE PROCESSING?

Online processing is a method of data processing in which data is entered, processed and the results are made available immediately and in real-time. It allows immediate interaction between the user and the system through connected devices and networks.



KEY FEATURES



Real-time Processing

Data is processed instantly as it is entered.



Immediate Response

Users get immediate results and feedback.



Two-way Communication

Continuous interaction between user and system.



Up-to-date Information

Data is always current and accurate.



Network Dependent

Relies on computer networks and communication systems.

HOW ONLINE PROCESSING WORKS



1 Data Entry

User enters data online through a connected device.



2 Data Transmission

Data is sent over the network to the central system / server.



3 Data Processing

The system processes the data immediately as per instructions or rules.



4 Result Generation

Results are generated instantly after processing.



5 Result Output

Results are sent back to the user in real-time for immediate use.

ADVANTAGES

- ✓ Provides immediate results and feedback.
- ✓ Improves efficiency and accuracy.
- ✓ Reduces waiting time and delays.
- ✓ Easy monitoring and up-to-date reporting.
- ✓ Better decision making with real-time data.

EXAMPLES OF ONLINE PROCESSING



Online Banking



E-Commerce Transactions



Online Ticket Booking



Digital Payments (UPI, Wallets)



Online Exam Systems



Stock Trading Platforms



Hospital Information Systems



Cloud-based Applications

KEY POINTS TO REMEMBER

- ★ Online processing provides real-time interaction between user and system.
- ★ It is essential for applications that require instant data processing and immediate results.
- ★ It depends on reliable hardware, software and stable network connections.
- ★ It is widely used in banking, education, e-commerce, healthcare and many more fields.





BATCH PROCESSING

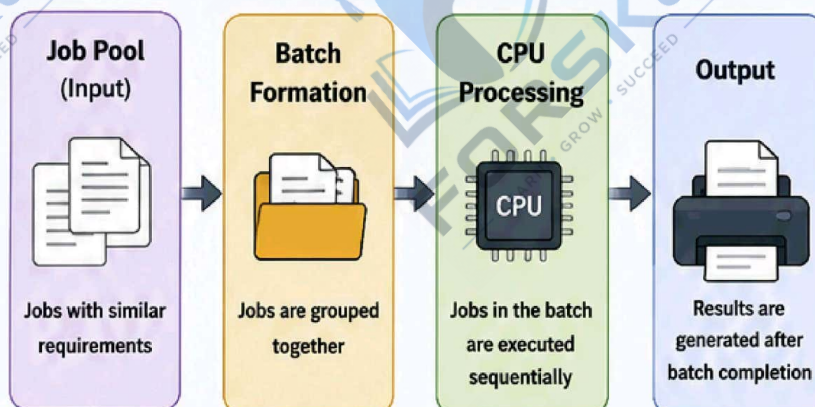


Batch Processing is an operating system method in which similar jobs are collected together in a batch and executed as a group **without user intervention**.

HOW IT WORKS

- Job Collection**
Similar jobs are collected together to form a batch.
- Batch Formation**
The jobs are grouped in the order of arrival.
- Batch Processing**
The operating system loads the batch into memory and executes the jobs one by one.
- Output Generation**
The output of the all jobs is produced after the entire batch is processed.

PROCESS FLOW DIAGRAM



EXAMPLE



A bank collects all deposit slips during the day. At the end of the day, it processes all slips together. This is **Batch Processing**.

CHARACTERISTICS

- Jobs are collected and executed as a group (batch).
- No interaction between user and computer during processing.
- High throughput (more jobs in less time).
- Better CPU utilization.
- Results are available only after the entire batch is processed.



ADVANTAGES

- Improved system throughput.
- Efficient for large volume of similar jobs.
- Reduced idle time of CPU.
- Cost-effective.



DISADVANTAGES

- No user interaction during processing.
- Long turnaround time.
- Difficult to debug.
- Failure of one job may affect the whole batch.



USES / APPLICATIONS

- Payroll processing
- Billing systems
- Bank statement generation
- Exam result processing
- Any repetitive and large volume jobs



KEY POINT

Batch Processing was used in early computers when user interaction was not possible. It is still used in many areas where large amounts of data are processed in groups.





REAL TIME PROCESSING

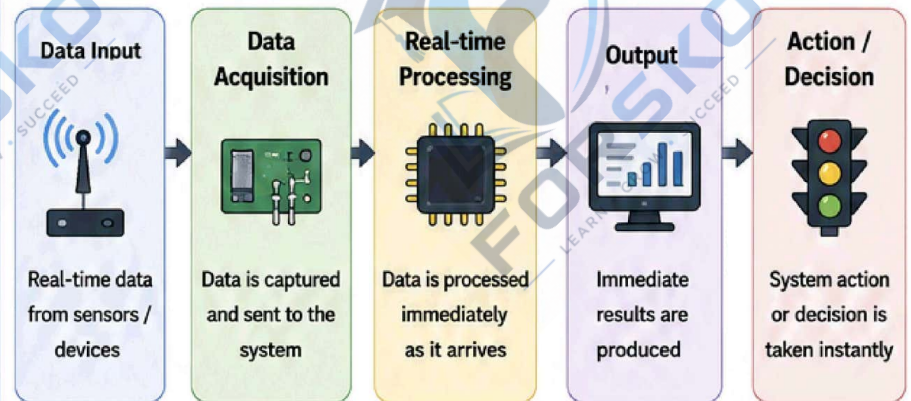


Real Time Processing (RTP) is a type of data processing in which data is processed **immediately** as it is received, and the output is produced within a **very short time**, often in milliseconds.

HOW IT WORKS

- 1 Data is Captured**
Data is collected from sensors or devices in real time.
- 2 Data is Transmitted**
The data is sent to the system without delay.
- 3 Data is Processed**
The system processes the data instantly as it arrives.
- 4 Immediate Output**
The result is produced immediately and used for decision making or control.

PROCESS FLOW DIAGRAM



KEY POINT

The main goal of Real Time Processing is to respond to events within a **strict time limit**.

CHARACTERISTICS

- Very fast processing (millisecond response).
- Timely and deterministic – response time is predictable.
- Handles continuous data streams.
- High reliability and accuracy.
- Used in time-critical applications.



EXAMPLES / APPLICATIONS



Medical Monitoring Systems

Patient vitals are monitored in real time.



Air Traffic Control

Real-time monitoring of flights for safe navigation.



Industrial Automation

Machines and robots are controlled in real time.



ATM Transactions

Transactions are processed instantly.



Stock Market Trading

Trading decisions and updates occur in real time.

ADVANTAGES

- ✓ Provides immediate response.
- ✓ Improves efficiency and performance.
- ✓ Essential for critical and time-sensitive tasks.
- ✓ Helps in better decision making.
- ✓ Increases safety and reliability.

CHALLENGES

- Requires high-speed hardware and network.
- Complex to design and maintain.
- Cost of implementation is high.
- Failure or delay can cause serious consequences.



TYPES OF REAL TIME SYSTEMS



1. HARD REAL TIME SYSTEM

The system must respond within the deadline. Missing the deadline may cause system failure.

Example: Airbag system in a car



2. SOFT REAL TIME SYSTEM

The system should respond within the deadline. Missing the deadline may degrade performance but not failure.

Example: Video streaming, online gaming



IN SHORT

Real Time Processing means processing data as it arrives and producing output instantly, ensuring timely response and smooth operation of critical systems.





TIME SHARING PROCESSING

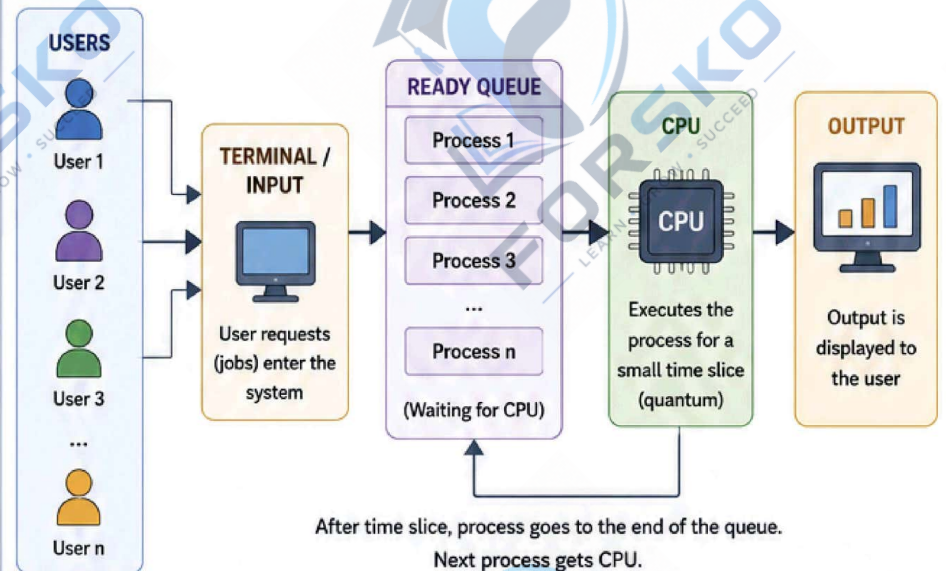


Time Sharing Processing is an operating system technique that allows **multiple users** to use the computer system **simultaneously** by sharing the CPU time in very small intervals called **time slices (quantum)**.

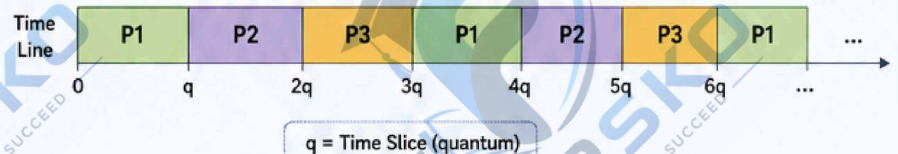
HOW IT WORKS

- Multiple Users**
Many users are connected to the system through terminals.
- Time Slice Allocation**
CPU time is divided into small time slices (quantum).
- Ready Queue**
All user processes are kept in a ready queue.
- CPU Scheduling**
The CPU is given to the first process in the queue for one time slice.
- Process Rotation**
After the time slice, the process is moved to the end of the queue and next process gets the CPU. This continues repeatedly.

PROCESS FLOW DIAGRAM



EXAMPLE OF TIME SLICE ALLOCATION



CHARACTERISTICS

- CPU time is shared among multiple users.
- Each user gets a small portion of CPU time.
- Fast response time (usually in seconds or less).
- Users can interact with the system while their programs are running.
- Requires a time-sharing operating system.



ADVANTAGES

- ✓ Allows multiple users to use the system simultaneously.
- ✓ Provides quick response time.
- ✓ Better CPU utilization.
- ✓ Improves system throughput.
- ✓ Interactive and user-friendly.



DISADVANTAGES

- ✗ Requires more memory and CPU overhead.
- ✗ Complex to design and manage.
- ✗ Security and data protection are important.
- ✗ Performance may degrade if too many users are connected.



APPLICATIONS

- Online reservation systems (Railway/Airline).
- Banking systems.
- Multi-user operating systems.
- Educational institutions and universities.
- Any system requiring user interaction.

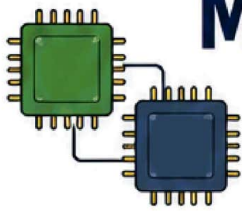


KEY POINT

Time Sharing gives the **illusion** that each user has a **dedicated computer**, because the system switches between users so quickly that each one feels they are working on the system alone.



Time Sharing = Multiple Users + Small Time Slices + Fast Switching + Interactive System



MULTIPROCESSING SYSTEMS



Multiprocessing System is a computer system that has **two or more CPUs (processors) working together** to perform multiple tasks simultaneously.

WHAT IS IT?

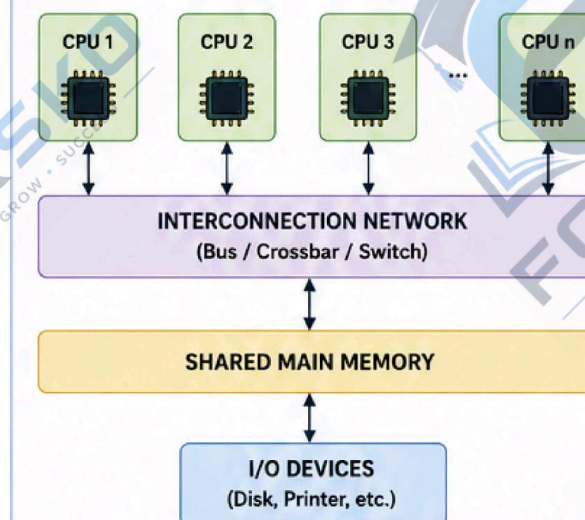


A multiprocessor (or multiprocessing) system contains two or more independent processors that cooperate with each other to execute programs, increase throughput, and improve reliability.

HOW IT WORKS

- 1 Multiple CPUs are connected to a common main memory through an interconnection network.
- 2 The operating system distributes processes or threads among the available processors.
- 3 Each processor executes its assigned tasks independently and in parallel.
- 4 Processors communicate and synchronize with each other when required.
- 5 Results are combined to produce the final output.

ARCHITECTURE DIAGRAM

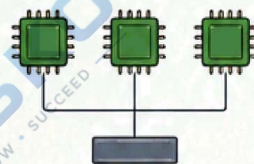


KEY COMPONENTS

- Multiple CPUs**
Two or more independent processors.
- Interconnection Network**
Provides communication between CPUs, memory and I/O devices.
- Shared Memory**
All processors access the same main memory.
- I/O Devices**
Used by processors for input/output operations.

TYPES OF MULTIPROCESSING SYSTEMS

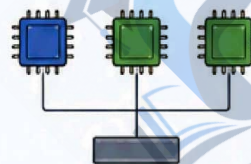
1. Symmetric Multiprocessing (SMP)



All processors are equal and share memory and I/O equally.

Example: Most modern servers, desktops.

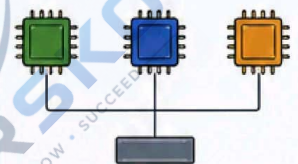
2. Asymmetric Multiprocessing (AMP)



One processor acts as master and others as slaves.

Example: Early multi-core systems, embedded systems.

3. Heterogeneous Multiprocessing (HMP)



Different types of processors work together in a system.

Example: Systems with GPU + CPU, DSP + CPU.

CHARACTERISTICS

- Two or more CPUs in a single system.
- Processors work in parallel.
- Share common memory and I/O.
- Improves performance and reliability.
- Requires an operating system that supports multiprocessing.



ADVANTAGES

- ✓ Higher processing speed.
- ✓ Increased throughput.
- ✓ Better CPU utilization.
- ✓ Improved reliability and fault tolerance.
- ✓ Economical – tasks are shared.
- ✓ Scalability – more CPUs can be added.



APPLICATIONS

- Scientific and engineering computations (simulations, weather forecasting).
- Database and web servers.
- Operating systems and virtualization.
- Image and video processing.
- Artificial Intelligence and Machine Learning.
- Cloud computing and data centers.



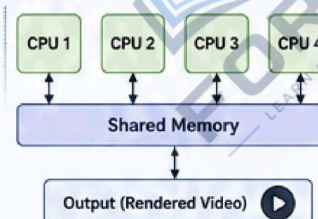
CHALLENGES

- ✗ High cost of hardware.
- ✗ Complex design and maintenance.
- ✗ Need for special OS and software.
- ✗ Communication overhead between processors.
- ✗ Not all tasks can be parallelized.



EXAMPLE

A video editing software uses multiple CPUs to render video faster.



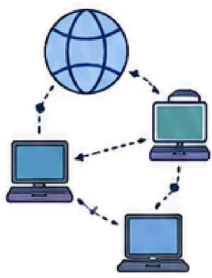
The work is divided and done in parallel, reducing total processing time.



KEY POINT

Multiprocessing Systems use two or more CPUs to work together in parallel, improving speed, efficiency, and reliability for large and critical computing tasks.





DISTRIBUTED DATA PROCESSING SYSTEM



A Distributed Data Processing System (DDPS) is a computing system in which data processing tasks are distributed across **multiple interconnected computers (nodes)** located at different locations, which cooperate to achieve a common goal.

KEY CONCEPT



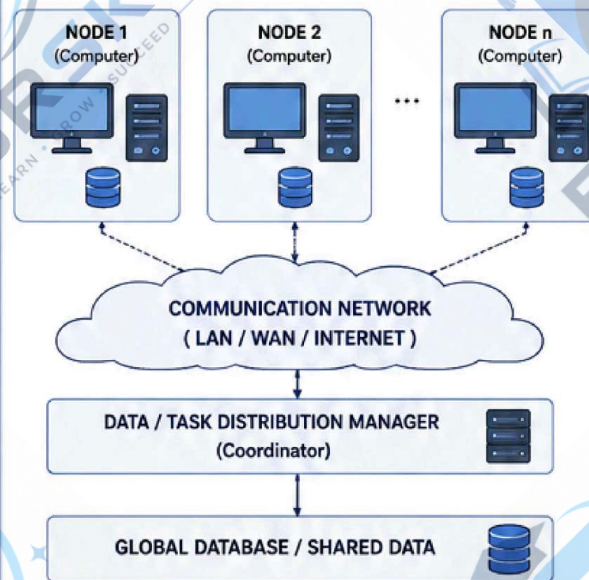
Instead of a single central computer handling all the data and processing, DDPS distributes data and tasks across multiple systems connected through a communication network. These systems work together and share resources, data and results.

MAIN FEATURES

- ✓ Data is distributed across multiple locations.
- ✓ Processing is performed in parallel.
- ✓ Nodes communicate through a network.
- ✓ Provides transparency, scalability and reliability.
- ✓ Supports resource sharing and load balancing.



ARCHITECTURE / WORKING



HOW IT WORKS

- 1 Data is divided into smaller pieces and stored across multiple nodes.
- 2 Tasks are divided and assigned to different nodes.
- 3 Each node processes its assigned data independently.
- 4 Results from all nodes are combined to produce the final output.
- 5 The system ensures synchronization, consistency and reliability.

TYPES OF DISTRIBUTED DATA PROCESSING SYSTEMS

1. Client-Server System



The server stores data and provides services, while clients request and use them.
Example: Web applications, database servers.

2. Peer-to-Peer (P2P) System



All nodes are equal and can act as both clients and servers.
Example: File sharing, blockchain networks.

3. Multi-tier System



Work is divided among presentation, application and database servers.
Example: Enterprise applications, online banking.

ADVANTAGES

- ✓ High speed and performance (Parallel processing).
- ✓ Improved reliability and fault tolerance.
- ✓ Scalability – easily expandable.
- ✓ Better resource utilization.
- ✓ Supports large volumes of data.
- ✓ Reduced processing time.



APPLICATIONS

- Distributed databases
- Cloud computing
- Big data analytics
- E-commerce and online services
- Banking and financial systems
- Scientific research and simulations
- Content delivery networks (CDN)



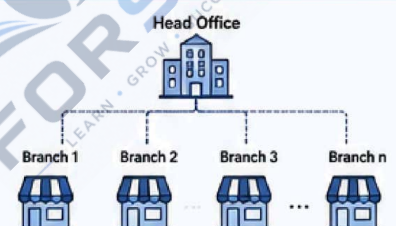
CHALLENGES

- ✗ Complex design and management.
- ✗ Network dependency and failures.
- ✗ Security and data consistency issues.
- ✗ Communication overhead.
- ✗ Cost of implementation.



EXAMPLE SCENARIO

A retail company has branches in different cities. Each branch system (node) stores local sales data and processes transactions. All branches are connected to the head office system. The head office combines data from all branches to generate reports and make decisions.

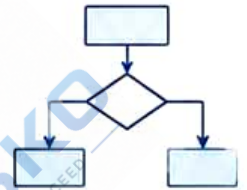


IN SHORT

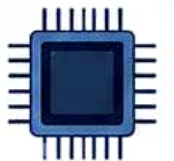
A Distributed Data Processing System uses multiple interconnected computers to share data, distribute tasks and work together, providing faster, reliable and scalable data processing.



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Unit - II





MASTER FILE

A Master File is a collection of relatively permanent data that changes infrequently and is used throughout the organization.



DEFINITION



A Master File stores core or reference data about entities (such as employees, customers, products, suppliers, etc.) that is used by many applications and transactions repeatedly.

KEY CHARACTERISTICS

- ✓ Contains relatively permanent and stable data.
- ✓ Changes occur rarely.
- ✓ Used repeatedly by many applications and transactions.
- ✓ Acts as a source of information for processing.
- ✓ Maintains consistency and accuracy in data.

EXAMPLES OF MASTER FILES



Employee Master File



Customer Master File



Product Master File



Supplier Master File

PURPOSE / IMPORTANCE

- Provides accurate and consistent data.
- Reduces data redundancy.
- Improves data integrity.
- Speeds up transaction processing.
- Supports decision making and reporting.



STRUCTURE OF MASTER FILE

Field Name	Description	Example (Employee Master File)	Type
Employee ID	Unique identification number	E00123	Alphanumeric
Name	Name of the employee	Rahul Sharma	Text
Department	Department name	Human Resources	Text
Designation	Job title	Manager	Text
Date of Joining	Date when employee joined	12-06-2022	Date
Salary	Current salary	60000	Numeric
...	...	...	...

HOW IT WORKS

- 1 Data is collected from various sources.
- 2 Validated and stored in the Master File.
- 3 Used by different systems for processing transactions.
- 4 Updated only when changes occur.



ADVANTAGES

- ✓ Ensures data accuracy and consistency.
- ✓ Minimizes data duplication.
- ✓ Saves storage space.
- ✓ Improves efficiency of operations.
- ✓ Provides a reliable source for reporting and decision making.



DISADVANTAGES

- ✗ Initial cost of creating master files is high.
- ✗ Requires proper control and maintenance.
- ✗ Data may become outdated if not updated regularly.
- ✗ Security and privacy must be ensured.



SAMPLE EMPLOYEE MASTER FILE (EXAMPLE)

Emp ID	Name	Department	Designation	Date of Joining	Salary	Phone No.
E001	Rahul Sharma	HR	Manager	12-06-2022	60000	9876543210
E002	Priya Mehta	Finance	Officer	15-07-2021	50000	9876543211
E003	Amit Verma	IT	Developer	20-08-2022	55000	9876543212
...	...	...	...	...	...	...



IN SHORT

A Master File is the backbone of an organization's information system. It holds stable, essential data that supports all day-to-day operations.





TRANSACTION FILE



A Transaction File is a collection of data generated by daily business activities. It records each transaction that occurs in the organization.

DEFINITION



A Transaction File stores detailed data about business events or transactions such as sales, purchases, payments, receipts, orders, etc. It is created frequently, changes constantly and is used to update master files and generate reports.

KEY CHARACTERISTICS

- ✓ Contains data about business events or transactions.
- ✓ Data changes frequently.
- ✓ Created daily and grows continuously.
- ✓ Used to update master files and generate reports.
- ✓ Often temporary and may be archived or purged.
- ✓ Provides detailed, up-to-date information.



EXAMPLES OF TRANSACTION FILES



Sales Transaction File



Purchase Transaction File



Payment Transaction File



Receipt Transaction File



Order Transaction File

PURPOSE / IMPORTANCE

- Records all business transactions accurately.
- Provides detailed data for processing.
- Helps in updating master files.
- Supports day-to-day operations.
- Generates reports for management decisions.
- Ensures proper tracking and control of activities.



STRUCTURE OF TRANSACTION FILE

Field Name	Description	Example (Sales Transaction File)	Type
Trans ID	Unique transaction number	T1001	Alphanumeric
Date	Date of transaction	01-05-2024	Date
Customer ID	ID of the customer	C101	Alphanumeric
Product ID	ID of the product	P201	Alphanumeric
Quantity	Quantity sold	5	Numeric
Unit Price	Price per unit	300	Numeric
Amount	Total amount	1500	Numeric
...	...	...	...

HOW IT WORKS

- 1 A transaction occurs (e.g., sale, purchase).
- 2 Details of the transaction are captured.
- 3 Data is stored in the Transaction File.
- 4 Data is used to update Master Files.
- 5 Reports are generated for decision making.



ADVANTAGES

- ✓ Provides up-to-date and detailed information.
- ✓ Improves accuracy of data processing.
- ✓ Helps in tracking daily business activities.
- ✓ Supports timely decision making.
- ✓ Records can be analyzed for better performance.



DISADVANTAGES

- ✗ Large volume of data requires more storage.
- ✗ Data must be processed and cleaned regularly.
- ✗ High transaction rate may affect performance.
- ✗ Data may become outdated if not processed.
- ✗ Requires proper security and backup.



SAMPLE SALES TRANSACTION FILE (EXAMPLE)

Trans ID	Date	Customer ID	Product ID	Quantity	Unit Price	Amount	Payment Mode
T1001	01-05-2024	C101	P201	5	300	1500	Cash
T1002	01-05-2024	C102	P103	2	750	1500	Card
T1003	02-05-2024	C101	P305	3	450	1350	UPI
T1004	02-05-2024	C103	P201	1	300	300	Cash
...	...	...	...	...	...	...	...



IN SHORT

A Transaction File captures daily business transactions in detail. It is dynamic in nature and plays a vital role in updating master files and providing accurate information for reports and analysis.





INTERMEDIATE FILES



An Intermediate File is a **temporary file** used to hold data during processing. It stores data between input and output so that it can be further processed in multiple stages.

DEFINITION



An Intermediate File is a file created by a program or process to store data temporarily while it is being processed. It acts as a bridge between input data and the final output.

KEY CHARACTERISTICS

- ✓ Temporary in nature.
- ✓ Used during processing of data.
- ✓ Created and used by system or application.
- ✓ Not required for long-term storage.
- ✓ May be updated many times.
- ✓ Deleted or overwritten after use.



PURPOSE / IMPORTANCE



- Breaks a large job into smaller steps.
- Holds data between processing stages.
- Improves system efficiency.
- Helps in sorting, merging and organizing data.
- Allows reusability of data in multiple operations.

ROLE IN DATA PROCESSING

1. INPUT

Raw data is read from input file.



Input File

2. PROCESSING STEP 1

Data is processed and stored in Intermediate File.



3. INTERMEDIATE FILE

Holds data temporarily for further processing.



4. PROCESSING STEP 2

Data from Intermediate File is further processed.



5. OUTPUT

Final results are written to output file.



Output File

EXAMPLES OF INTERMEDIATE FILES



1. Sort/Merge Intermediate File

Stores partially sorted data before final merge.



2. Report Intermediate File

Holds summarized data before generating final reports.



3. Backup Intermediate File

Stores temporary backup of data during update or conversion.



4. Work/Processing File

Used to store work results that will be used in next processing step.

WHERE ARE INTERMEDIATE FILES USED?



During sorting and merging operations



During report generation



During data conversion or transformation



During batch processing systems



During database updates and indexing

STRUCTURE / EXAMPLE

Example: Student Marks Intermediate File

Roll No.	Name	Subject	Marks
101	Amit	Maths	78
102	Neha	Maths	88
103	Rohan	Maths	65
104	Priya	Maths	92
...	...	...	...

This file may be used to calculate grades, create merit list, or prepare final report.



ADVANTAGES

- ✓ Improves efficiency by dividing work into stages.
- ✓ Reduces memory requirements.
- ✓ Supports reusability of data.
- ✓ Helpful for error recovery and restart.
- ✓ Facilitates complex processing in simple steps.



DISADVANTAGES

- ✗ Requires extra storage space.
- ✗ Increases I/O operations.
- ✗ Management of temporary files is required.
- ✗ If not properly handled, may lead to data inconsistency.



COMPARISON: MASTER FILE vs TRANSACTION FILE vs INTERMEDIATE FILE

	MASTER FILE	TRANSACTION FILE	INTERMEDIATE FILE
Nature	Permanent	Temporary (day-to-day)	Temporary (during processing)
Purpose	Stores core/reference data	Records business transactions	Holds data between processing stages
Change Frequency	Rarely changes	Changes frequently	Changes many times during process
Duration	Long-term	Short-term	Very short-term
Example	Employee Master File	Sales Transaction File	Sort Intermediate File



IN SHORT

Intermediate Files are temporary working storage used during processing to hold data between steps and help generate the final output efficiently.





BACKUP FILES

A Backup File is a copy of important data that is created and stored separately to protect the original data from loss, damage, or corruption.



DEFINITION



A Backup File is a duplicate copy of data stored in a separate location or storage medium to ensure data recovery in case of failure, accidental deletion, or disaster.

KEY CHARACTERISTICS

- ✓ Creates a copy of original data.
- ✓ Stored separately from original data.
- ✓ Helps in data recovery.
- ✓ Can be full, incremental or differential.
- ✓ May be scheduled or manual.
- ✓ Essential for data security and continuity.



IMPORTANCE

- ✓ Protects against data loss.
- ✓ Recovers data after system crash or failure.
- ✓ Defends against viruses, ransomware and human errors.
- ✓ Supports business continuity.
- ✓ Provides peace of mind and data reliability.



TYPES OF BACKUP FILES



1. FULL BACKUP

A complete copy of all data. Takes more time and storage.



2. INCREMENTAL BACKUP

Copies only the data changed since the last backup (full or incremental). Saves time and storage.



3. DIFFERENTIAL BACKUP

Copies only the data changed since the last full backup. Requires more storage than incremental.

WHERE BACKUP FILES ARE USED



Database systems – to recover database after failure.



Business applications – to restore important files.



Operating systems – to restore system settings and files.



Cloud storage – for offsite backup and disaster recovery.



Organizations – to ensure data safety and meet compliance requirements.

HOW BACKUP FILES ARE CREATED AND USED

1

SELECT DATA

Choose the files, folders or database to be backed up.



2

CREATE COPY

System copies the selected data.



3

STORE SEPARATELY

The copy is stored in a separate location or storage device.



4

USE WHEN NEEDED

In case of data loss, the backup file is used to restore the data.



EXAMPLE OF BACKUP SCENARIO

Original Data



System Failure



Restore from Backup File



Data is restored from backup file and system is back to normal.

STRUCTURE OF A BACKUP FILE (EXAMPLE)

Field Name	Description	Example
Backup ID	Unique ID for backup	BKP20240501
File/Database Name	Name of the original data	EmployeeDB
Backup Type	Full / Incremental / Differential	Full
Backup Date	Date and time of backup	01-05-2024 10:00 AM
Storage Location	Where the backup is stored	External HDD
Size	Size of backup file	2.5 GB
Created By	User or system name	Admin
...	...	...

ADVANTAGES

- ✓ Ensures data recovery in case of loss.
- ✓ Protects against accidental deletion or corruption.
- ✓ Helps in quick restoration of data.
- ✓ Supports business continuity and disaster recovery.
- ✓ Provides data security and reliability.



DISADVANTAGES

- ✗ Requires extra storage space.
- ✗ Takes time to create and maintain backups.
- ✗ Cost of storage devices or cloud backup.
- ✗ Backup files must be updated regularly.
- ✗ If backup is also damaged, recovery is not possible.

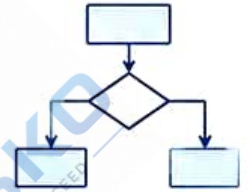


IN SHORT

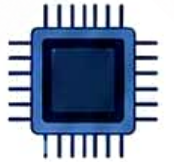
Backup Files are the safety copies of important data. They help in restoring data and maintaining smooth operations in case of any unexpected loss.



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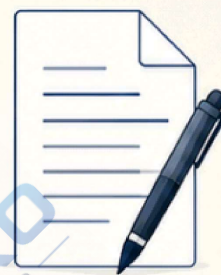


Unit - III





APPLICATIONS OF WORD PROCESSING



Word processing software is used to create, edit, format, save and print various types of documents. It is widely used in almost every field of life.

1



Business Documents

Used to create letters, memos, reports, proposals, invoices, quotations, and agendas.

2



Educational Use

Helpful in preparing notes, assignments, projects, question papers, and study materials.

3



Personal Use

Used for writing letters, resumes, diaries, applications, invitations, and cards.

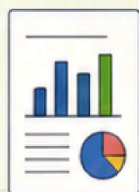
4



Official Correspondence

Used in offices for drafting and managing official letters, circulars, notices and memos.

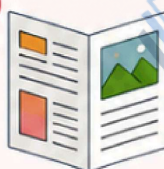
5



Reports and Documents

Used to prepare formal reports, surveys, case studies and documents with tables, charts and graphs.

6



Publishing and DTP

Used for desktop publishing like newsletters, brochures, booklets, manuals and flyers.

7



Record Keeping

Useful for maintaining records, forms, registers, minutes of meetings and employee details.

8



Communication

Helps in fast and accurate communication within organizations and to the public.



Time and Cost Saving

Automates formatting, spell checking, mail merge and templates, saving time, effort and cost.

BENEFITS

- ✓ Improves productivity
- ✓ Enhances accuracy
- ✓ Professional output
- ✓ Easy storage and retrieval



Word processing is an essential tool that increases efficiency and helps in handling a wide variety of documentation tasks in every field.





MENUS AND TOOLBAR OF WORD PROCESSING



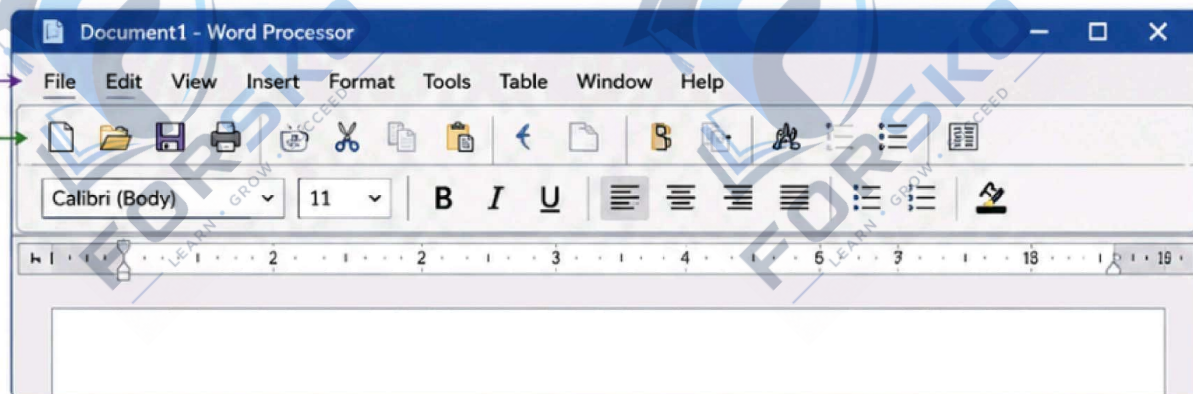
Menus and Toolbars provide easy access to commands and features in a word processing program. They help us create, edit, format and manage documents efficiently.

MENU BAR

Contains menu names. Clicking a menu opens a list of related commands.

TOOLBAR

Contains icons for commonly used commands for quick access.



MENU BAR – MAIN MENUS AND THEIR USES

1 FILE



- New – Create new document
- Open – Open existing document
- Save / Save As – Save document
- Print – Print document
- Exit – Close the program

2 EDIT



- Undo / Redo – Reverse or repeat actions
- Cut – Remove selected text
- Copy – Copy selected text
- Paste – Insert copied text
- Find / Replace – Search or replace text

3 VIEW



- Print Layout – Normal page view
- Web Layout – Webpage view
- Zoom – Enlarge or reduce view
- Ruler – Show or hide ruler
- Status Bar – Show or hide status bar

4 INSERT



- Page Break – Insert page break
- Table – Insert table
- Picture – Insert images
- Header / Footer – Add header or footer
- Page Number – Add page numbers

5 FORMAT



- Font – Change font type, size, style
- Paragraph – Align, indent, spacing
- Bullets & Numbering – Create lists
- Borders & Shading – Add borders and shading
- Styles – Apply document styles

6 TOOLS



- Spelling & Grammar – Check spelling and grammar
- Word Count – Count words and pages
- AutoCorrect – Auto correct mistakes
- Options – Change program settings

7 TABLE



- Insert Table – Insert a table
- Draw Table – Draw a custom table
- Delete – Delete rows, columns, or table
- Table Properties – Change table settings

8 WINDOW



- New Window – Open new document window
- Arrange All – Arrange multiple windows
- Split – Split window into panes
- Switch Windows – Switch between open documents

9 HELP



- Help Topics – Open help guide
- What's New – See new features
- About – Information about the program



TIP

Different word processing software may have additional menus or options, but the basic functions remain similar.

TOOLBAR – COMMON ICONS AND THEIR FUNCTIONS



IMPORTANCE

- Menus organize all commands in categories.
- Toolbars provide quick access to frequently used commands.
- Using menus and toolbars saves time and makes work easier.



Menus show all available commands, while toolbars give quick access to commonly used commands for efficient and effective work.





WORD PROCESSOR CREATING

— From a Blank Page to a Perfect Document —



A word processor helps us create, edit, format, save and print documents easily and efficiently.

STEPS IN CREATING A DOCUMENT

1 START THE WORD PROCESSOR



Open the word processor application (e.g., MS Word). A new, blank document appears.

2 CREATE A NEW DOCUMENT



Click on New → Blank Document to start creating a new file.

3 TYPE THE CONTENT



Enter text using the keyboard. The content appears on the page as you type.

4 EDIT THE CONTENT



Use editing features like Cut, Copy, Paste, Undo, Redo to correct and improve the content.

5 FORMAT THE DOCUMENT



Apply formatting to make the document attractive and organized.

- Font style, size, color
- Bold, Italic, Underline
- Alignment, spacing
- Bullets, numbering
- Margins, page layout

6 INSERT ELEMENTS



Enhance the document by inserting tables, pictures, shapes, charts, headers, footers, page numbers, and more.

7 REVIEW AND PROOFREAD



Check for spelling and grammar errors. Review the content for accuracy and clarity.

8 SAVE THE DOCUMENT



Save the document with a name in the desired location for future use.

File → Save or Ctrl + S

9 PRINT THE DOCUMENT



Preview the document and print it if needed.

- File → Print
- Choose printer and settings
- Click Print



KEY FEATURES USED

	Typing	Enter text easily.
	Editing	Modify text and correct mistakes.
	Formatting	Change the look and layout.
	Insert	Add tables, images, shapes, etc.
	Review	Check spelling and grammar.
	Save	Store the document for future use.
	Print	Take a hard copy of the document.

BENEFITS

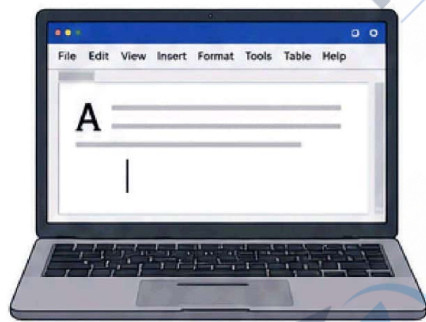
- ✓ Saves time and effort
- ✓ Improves productivity
- ✓ Professional and error-free documents
- ✓ Easy storage and retrieval
- ✓ Supports editing and updates
- ✓ Allows printing and sharing



SUMMARY

A word processor makes it easy to create, edit, format, save and print documents, making our work faster, better and more effective.





WORD PROCESSOR ENTERING



Entering is the first step in word processing. It means inputting text and data into the computer using a word processor.



Word processor entering involves keying in text, numbers, symbols and other data into a blank document. The entered data can be edited, formatted, saved and printed.

STEPS IN ENTERING A DOCUMENT

1 OPEN THE WORD PROCESSOR



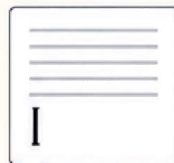
Start the word processor application (e.g., MS Word).

2 CREATE A NEW DOCUMENT



Choose New → Blank Document to open a new, empty page.

3 POSITION THE CURSOR



Place the cursor where you want to start typing.

4 ENTER THE TEXT



Type the text using the keyboard. The text appears on the screen.

5 SAVE THE DOCUMENT



Save the document with a suitable name for future use.

METHODS OF ENTERING DATA

KEYBOARD INPUT



- Most common method.
- Enter text, numbers, symbols and special characters.

COPY AND PASTE



- Copy text from another source and paste into the document.
- Saves time and effort.

INSERT OPTIONS



- Insert tables, pictures, shapes, charts, symbols, headers, footers, etc.
- Enhances the document content.

DICTATION (SPEECH TO TEXT)



- Speak through a microphone.
- Software converts speech into text.

FEATURES OF ENTERING

ABC	Typing	Enter text characters, numbers and symbols.
↶	Auto Correct	Automatically corrects common spelling mistakes.
🔍	Spell Check	Checks spelling and grammar while typing.
Aa	Case Change	Change text to UPPERCASE, lowercase or Title Case.
Ω	Special Characters	Insert symbols, mathematical signs and other characters.
↶	Undo / Redo	Undo or redo the entered text when needed.

IMPORTANCE OF ENTERING

- ✓ It is the first and most important step in creating any document.
- 📄 Accurate entering ensures the correctness of the document.
- 🕒 Saves time with features like copy-paste, auto correct and dictation.
- 📈 Makes editing, formatting and printing easier and faster.
- 📁 Helps create professional and well-structured documents.

SUMMARY



Word processor entering is the process of inputting text and data into a computer using different methods. It is the foundation of word processing and the first step towards creating a complete and useful document.





WORD PROCESSING SAVING AND PRINTING THE DOCUMENT

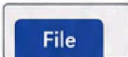
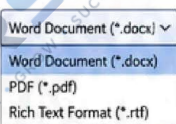


After creating and editing a document in a word processor, we save it to store for future use and print it to get a hard copy. These two operations are essential to keep our work safe and share it in physical form.

SAVING THE DOCUMENT

Saving a document stores it on a storage device with a name, so that it can be opened and used again later.

STEPS TO SAVE A DOCUMENT

- 1 Click on File tab**
Click on the File tab in the menu. 
- 2 Choose Save or Save As**
Select **Save** to save the existing file or **Save As** to save with a new name or location. 
- 3 Choose Location**
Select the folder or location where you want to save the document. 
- 4 Enter File Name**
Type a suitable name for your document in the File name box. 
- 5 Choose File Type (if needed)**
Select the file format (e.g., Word Document *.docx, PDF, etc.) from the Save as type list. 
- 6 Click Save**
Click the Save button. The document is now stored at the selected location. 

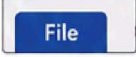
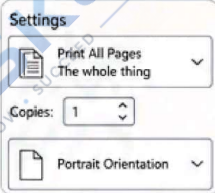
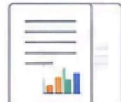
IMPORTANT POINTS (SAVING)

- Save your work regularly to avoid data loss.
- Use meaningful file names for easy identification.
- Save in the correct location.
- Use Save As to create a new copy with a different name or format.

PRINTING THE DOCUMENT

Printing a document produces a hard copy on paper using a printer.

STEPS TO PRINT A DOCUMENT

- 1 Open the Document**
Open the document you want to print. 
- 2 Click on File tab**
Click on the File tab in the menu. 
- 3 Choose Print**
Click on Print from the left panel (or press Ctrl + P). 
- 4 Select Printer**
Choose the printer you want to use from the list. 
- 5 Choose Settings**
Select the print settings as required:
 - Pages (All / Current / Page range)
 - Number of copies
 - Orientation (Portrait / Landscape)
 - Paper size, etc.
- 6 Preview the Document**
Check the print preview to see how the document will look on paper. 
- 7 Click Print**
Click the Print button to send the document to the printer. 

IMPORTANT POINTS (PRINTING)

- Check the printer is connected and has paper and ink.
- Always preview before printing to avoid errors.
- Select the correct settings to save paper and ink.
- Use appropriate margins and font size for better print quality.

BENEFITS

Saving the Document

- ✓ Prevents loss of work.
- ✓ Allows editing and updating in the future.
- ✓ Easy to share electronically.
- ✓ Keeps multiple copies in different formats.



Printing the Document

- ✓ Provides a hard copy for records.
- ✓ Useful for reading without a screen.
- ✓ Can be submitted, signed or filed.
- ✓ Helps in presentations and meetings.



SUMMARY



Saving stores your document for future use and safety. Printing gives a hard copy of your work on paper. Both saving and printing are important steps to complete your work effectively.



Create & Edit



Save



Print



WORD PROCESSING

EDITING AND FORMATTING TEXT



After entering text in a word processor, we edit it to correct and improve the content. We format it to change the appearance and make the document attractive and easy to read.

EDITING TEXT

Editing means making changes to the text for correction, improvement or rearrangement.



Cut

Removes the selected text and moves it to the Clipboard.

Ctrl + X



Copy

Copies the selected text to the Clipboard.

Ctrl + C



Paste

Inserts the text from the Clipboard at the cursor position.

Ctrl + V



Undo

Reverses the last action.

Ctrl + Z



Redo

Restores the last action that was undone.

Ctrl + Y



Find

Searches for specific text, words or phrases.

Ctrl + F

ab → ac

Find and Replace

Finds specific text and replaces it with new text.

Ctrl + H



Spelling & Grammar Check

Checks and corrects spelling and grammar errors.

F7

FORMATTING TEXT

Formatting means changing the appearance of text to make it clear, attractive and well organized.

Home	Insert	Design	Layout	References	Mailings	Review	View
Calibri (Body) 11 A A A [Bulleted List] [Numbered List] [Decrease Indent] [Increase Indent]							
B I U [Text Color] [Highlight Color] [Font Color]							
A	Font	Changes the font type of the text.			Times New Roman		
T T	Font Size	Changes the size of the text.			Small Medium Large		
B I U	Bold, Italic, Underline	Makes text Bold , <i>Italic</i> or Underlined.			This is Bold , <i>Italic</i> and Underlined.		
A	Font Color	Changes the color of the text.			Text in Red		
	Text Highlight Color	Highlights the background of the selected text.			Highlighted Text		
	Alignment	Aligns text Left, Center, Right or Justified.			Left Center Right Justify		
	Bullets and Numbering	Creates bulleted or numbered lists.			Item One Item Two Item Three 1. Point One 2. Point Two 3. Point Three		
	Line and Paragraph Spacing	Adjusts the space between lines and paragraphs.			Line spacing 1.0 Line spacing 1.5 Line spacing 2.0		
	Indentation	Moves text inward from the left or right margin.			Normal Text Left Indent Right Indent		
	Borders and Shading	Adds borders or shading to text, paragraphs or pages.			Bordered Text		

KEY POINTS



- Editing improves accuracy and clarity of the content.
- Formatting improves the presentation and readability.
- Both editing and formatting are essential steps in creating professional documents.

BENEFITS



- ✓ Improves the quality and readability of documents
- ✓ Helps in organizing and presenting information effectively
- ✓ Saves time and enhances productivity
- ✓ Creates professional and impressive documents



REMEMBER: Edit to correct the text. Format to make it look better!





WORD PROCESSING

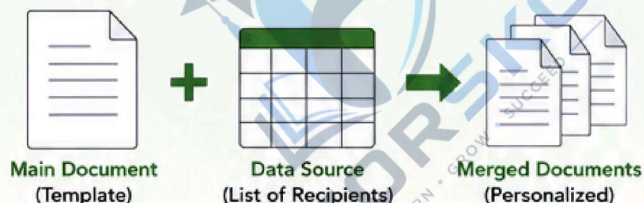
MAIL MERGE AND MACROS



Mail Merge helps create many personalized documents quickly.
Macros help automate repetitive tasks to save time and effort.

MAIL MERGE

Mail Merge is a feature that allows you to create multiple documents (letters, labels, envelopes, emails) by inserting data from a data source into a main document.



EXAMPLE Sending appointment letters to many patients using one template and a list of patient details.



STEPS IN MAIL MERGE (in MS Word)

- 1 Open Main Document**
Create or open the document (e.g., letter) that will be used as the main document.
- 2 Start Mail Merge**
Go to Mailings tab → Start Mail Merge and choose the document type (Letters / Labels / Envelopes / Emails).
- 3 Select Recipients**
Choose the data source:
Use an existing list (Excel, CSV, Access) or type a new list.
- 4 Insert Merge Fields**
Insert placeholders (merge fields) like «Name», «Address», «Date» at the required places in the document.
- 5 Preview Results**
Click Preview Results to see how the merged documents will look.
- 6 Finish & Merge**
Click Finish & Merge and choose Edit Individual Documents, Print Documents or Send E-mail.
- 7 Complete**
Word creates separate, personalized documents for each recipient.

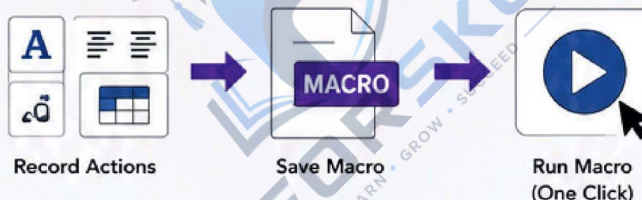
ADVANTAGES OF MAIL MERGE

- ✓ Saves time by creating many documents at once.
- ✓ Reduces typing errors.
- ✓ Personalizes letters, labels, emails, etc.
- ✓ Useful for bulk communication.



MACROS

A Macro is a sequence of instructions that you record and save to automate repetitive tasks in a document. It can be run anytime with a single click.



EXAMPLE Automatically apply same formatting, insert heading, table and footer in every new document with one click.

STEPS TO CREATE AND RUN A MACRO

- 1 View Tab**
Go to View tab → Macros → Record Macro.
- 2 Name the Macro**
Enter a name for the macro.
(e.g., FormatReport)
- 3 Assign Shortcut (Optional)**
Assign a keyboard shortcut to run the macro quickly.
- 4 Start Recording**
Click OK. Word starts recording your actions.
- 5 Perform the Actions**
Do the tasks you want to automate (formatting, inserting text, tables, etc.).
- 6 Stop Recording**
Go to View tab → Macros → Stop Recording.
- 7 Run the Macro**
Run the macro from Macros list or use the shortcut key.

ADVANTAGES OF MACROS

- ✓ Automates repetitive and time-consuming tasks.
- ✓ Ensures consistency in documents.
- ✓ Increases productivity and accuracy.
- ✓ Simple tasks can be completed with one click.



MAIL MERGE

KEY DIFFERENCE

MACROS

Used to create multiple personalized documents from a data source.		Purpose	Used to automate and repeat a set of actions.
Works with data (names, addresses, details).		Works With	Works with commands and actions.
Example: Letters, Labels, Envelopes, Emails.		Examples	Example: Apply formatting, insert header & footer, create reports automatically.
Uses Mailings tab.		Location	Uses View tab → Macros.

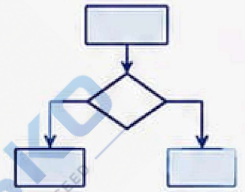


SUMMARY:

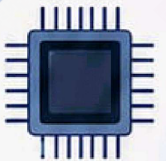
Mail Merge is for creating many personalized documents using data.
Macros are for automating repetitive tasks to work faster and smarter.



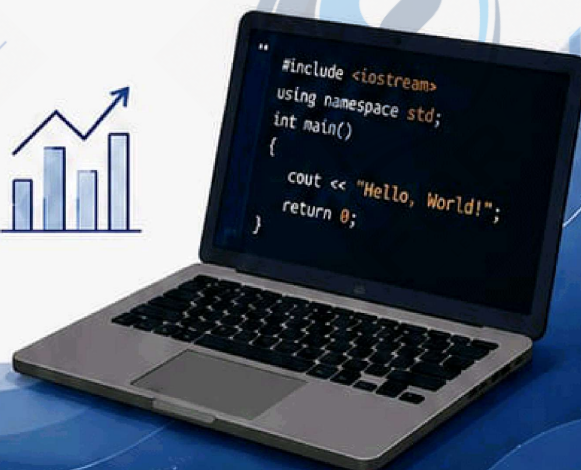
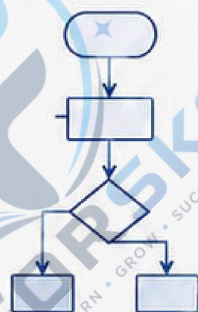
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Unit - IV





SPREADSHEET APPLICATION

Organize • Calculate • Analyze • Visualize Data



A spreadsheet application is a software program that allows users to organize data in rows and columns, perform calculations, analyze data and create charts and reports.

COMPONENTS OF A SPREADSHEET

Diagram illustrating the components of a spreadsheet application interface:

- Name Box:** Displays the active cell address (e.g., C5).
- Formula Bar:** Displays the formula or data entered in the active cell (e.g., $=B5 \times C5$).
- Column Headings:** Labels for columns (A, B, C, D, E, F, G).
- Row Headings:** Labels for rows (1, 2, 3, 4, 5, 6, 7).
- Worksheet Tabs:** Labels for different sheets (Sheet1, Sheet2, Sheet3).
- Scroll Bars:** Horizontal and vertical bars for navigating through the data.
- Active Cell:** The cell currently selected for editing (e.g., C5).

The diagram shows a sample spreadsheet titled "Sales Report" with columns for Product, Units Sold, Unit Price, and Total Sales. The data is organized in rows, and the total sales are calculated using the formula $=B5 \times C5$.

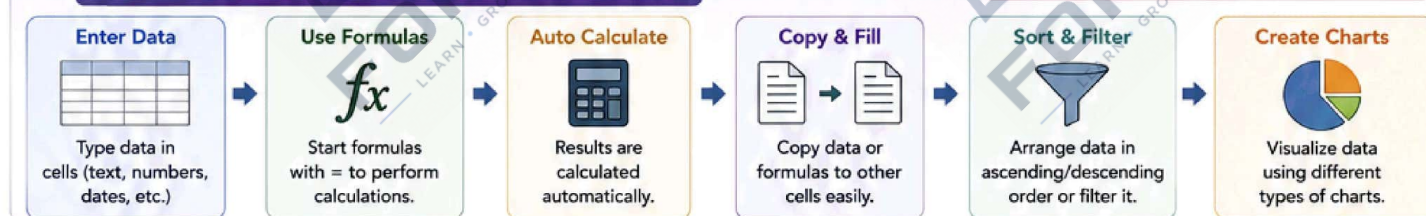
KEY FEATURES

- ✓ Organize data in a table format
- ✓ Perform automatic calculations
- ✓ Use formulas and functions
- ✓ Analyze and visualize data
- ✓ Create charts and reports
- ✓ Sort, filter and format data
- ✓ Save, print and share easily

USES / APPLICATIONS

- Business & Finance**
Budgeting, accounting, financial statements
- Data Analysis**
Analyze trends, compare data and make decisions
- Education**
Grade sheets, marks calculation, attendance
- Inventory Management**
Track stock, sales and suppliers
- Reports & Charts**
Create professional reports and charts

BASIC OPERATIONS IN A SPREADSHEET



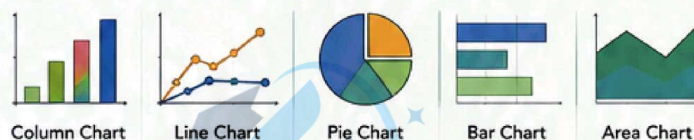
COMMONLY USED FUNCTIONS

Function	Use	Example	Result
SUM()	Adds numbers	$=\text{SUM}(B2:B6)$	927500
AVERAGE()	Finds average	$=\text{AVERAGE}(B2:B6)$	17.5
COUNT()	Counts numbers	$=\text{COUNT}(B2:B6)$	4
MAX()	Finds largest value	$=\text{MAX}(C2:C6)$	55000
MIN()	Finds smallest value	$=\text{MIN}(C2:C6)$	1500

Functions save time and reduce errors in calculations.

DATA VISUALIZATION

Spreadsheets help convert data into meaningful charts.



Charts make data easy to understand and help in better decision making.

ADVANTAGES OF SPREADSHEET APPLICATIONS



Saves time with automatic calculations



Improves accuracy and reduces errors



Handles large amounts of data



Powerful data analysis and visualization



Easy to share and collaborate



Print ready reports

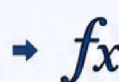
SUMMARY



Spreadsheet applications are powerful tools used to store, organize, calculate, analyze and visualize data efficiently. They are widely used in businesses, education and everyday life to make data-driven decisions.



Enter Data



Calculate



Analyze



Visualize



Report

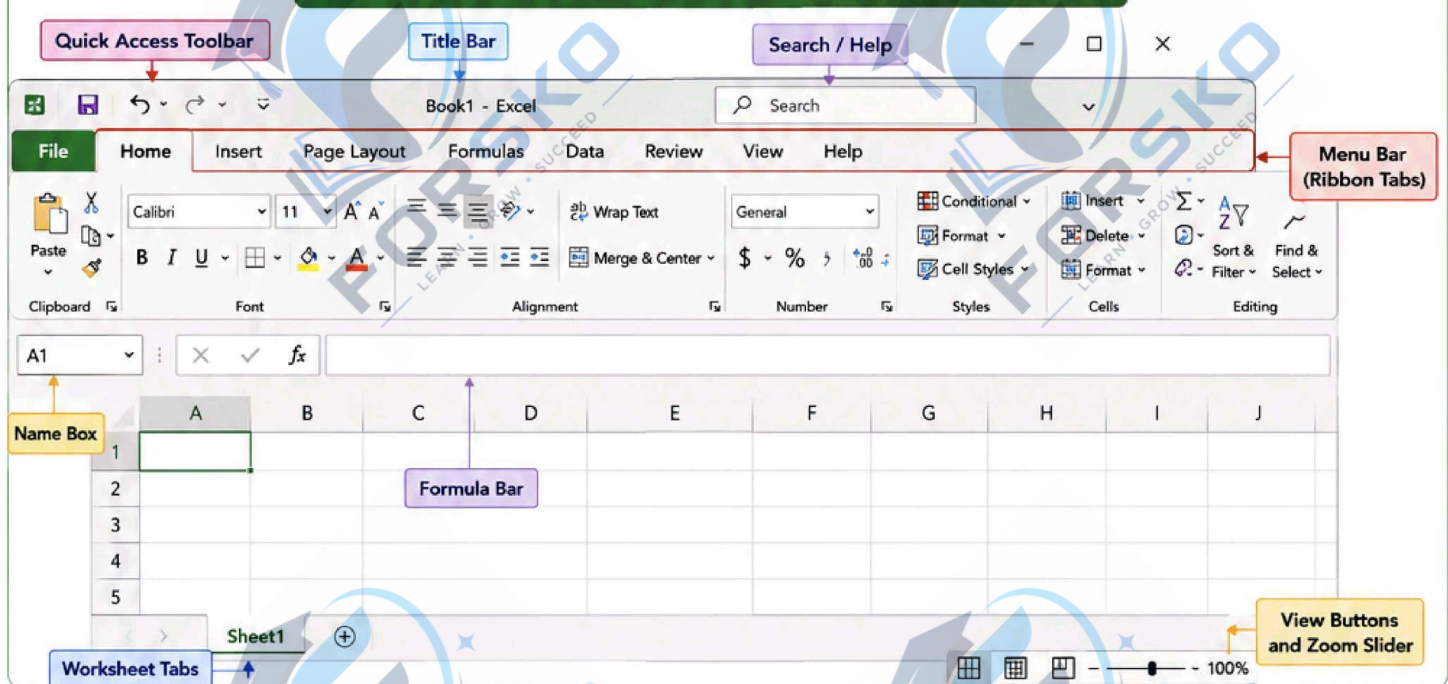


SPREADSHEET MENU AND TOOL BAR



Spreadsheet applications organize data in rows and columns and provide powerful menus and toolbar commands to create, edit, format, analyze and present data efficiently. Example: Microsoft Excel, Google Sheets, LibreOffice Calc, etc.

SPREADSHEET WINDOW OVERVIEW (Example: Microsoft Excel)



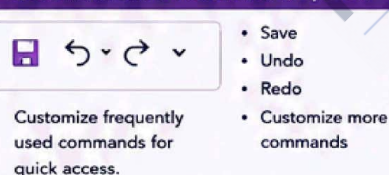
MENU TABS (RIBBON TABS) AND THEIR USES

File	Create, open, save, print, share, export, account and options.	New	Open	Save	Print	Share	Export	Options
Home	Clipboard, font, alignment, number formatting, styles, cells and editing.	Paste	Font	Alignment	Number	Styles	Editing	
Insert	Insert tables, charts, pictures, shapes, text, symbols, header/footer, etc.	Table	Pictures	Chart	Shapes	Text Box	Header & Footer	Symbol
Page Layout	Themes, margins, orientation, size, print area, background, print titles, etc.	Themes	Margins	Orientation	Size	Print Area	Breaks	Print Titles
Formulas	Insert functions, define names, formula auditing, calculation options.	Insert Function	AutoSum	Recently Used	Financial	Logical	Text	More Functions
Data	Get & transform data, sort, filter, data tools, what-if analysis, outline.	Get Data	Sort	Filter	Data Validation	Remove Duplicates	What-If Analysis	Group
Review	Spelling, comments, protect sheet/workbook, track changes.	Spelling	Comments	Protect Sheet	Protect Workbook	Allow Edit Ranges	Track Changes	
View	Workbook views, show/hide, zoom, window, macros.	Normal	Page Break Preview	Zoom	Freeze Panes	New Window	Arrange All	Macros
Help	Help topics, support, feedback, about.	Help	Support	Feedback	What's New	About		

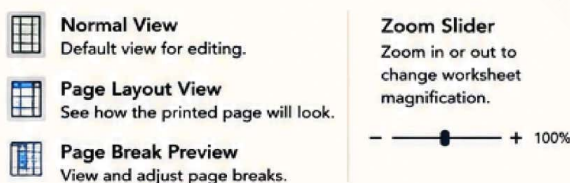
IMPORTANT TOOLBAR AREAS (Home Tab)

Clipboard	Paste	Cut	Copy	Format Painter
Font	Calibri	11	Font type, size, bold, italic, underline, borders, fill color, font color, etc.	
Alignment	Align text, wrap text, merge cells, text direction.			
Number	General	Number format (General, Currency, Percentage, Date, Decimals, etc.)		
Cells	Insert	Delete	Format	Insert or delete cells, rows, columns and format cell size, visibility, etc.
Editing	AutoSum	Fill	Clear	Sort & Filter, Find & Select.

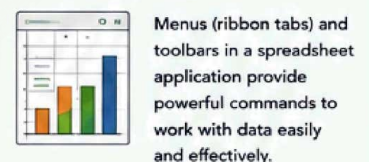
QUICK ACCESS TOOLBAR (Top Left)



VIEW BUTTONS AND ZOOM (Bottom Right)



SUMMARY





SPREADSHEET PREPARING TABLE

Organize Data • Make it Clear • Easy to Analyze



A spreadsheet table is a collection of related data organized in rows and columns. Preparing a well-structured table makes data easy to read, update and analyze.

EXAMPLE: STUDENT MARKS TABLE

	A	B	C	D	E	F	G
1	Student Marks Table						
2	Roll No.	Student Name	English	Maths	Science	Total	Average
3	1	Aisha	85	90	88	263	87.67
4	2	Bilal	78	82	80	240	80.00
5	3	Charu	92	95	90	277	92.33
6	4	Danish	65	70	68	203	67.67
7	Total		320	337	326	983	82.42

Row Headings
(1, 2, 3...)

Column Headings
(A, B, C...)

Data
(Values)

Calculated
Results

BENEFITS OF A WELL PREPARED TABLE

- ✓ Data is organized and easy to understand
- ✓ Reduces errors and saves time
- ✓ Helps in sorting, filtering and calculation
- ✓ Makes reports and charts more effective
- ✓ Easy to update and maintain

GOOD TABLE DESIGN TIPS



Use Clear Titles

Give your table a meaningful title.



Use Headings

Use clear and descriptive column headings.



Format Properly

Apply bold text, borders and shading to highlight headings.



Align Data

Align text to left, numbers to right or center for clarity.



Use Consistent Format

Use same number format, date format and text style.



Keep Data Clean

Avoid blank rows/columns, duplicate data and extra spaces.

STEPS TO PREPARE A TABLE IN A SPREADSHEET (Example: Microsoft Excel / Google Sheets)

1 Enter the Data

Type your data in rows and columns.

	A	B	C
1	Roll No.	Name	Marks
2	1	Aisha	85
3	2	Bilal	78
4	3	Charu	92

2 Add Column Headings

Type clear headings in the first row.

	A	B	D
1	Roll No.	Student Name	Marks
2	1	Aisha	85
3	2	Bilal	78
4	3	Charu	92

3 Format Headings

Make headings bold, change font color, add fill color.

	A	B	D
1	Roll No.	Student Name	Marks
2			
3			

4 Adjust Column Width

Drag the column borders to fit the content.

	A	B	C
1			
2			
3			
4			

5 Apply Borders

Select the table range and apply borders.

	A	B	C
1	Roll No.	Name	Marks
2	1	Aisha	85
3	2	Bilal	78
4	3	Charu	92

6 Format Data

Apply number format, alignment and cell styles.

	A	B	C
1	Roll No.	Student Name	Marks
2	35	Aisha	85
4	22	Bilal	78
4	32	Charu	92

7 Calculate (if needed)

Use formulas for totals, averages, etc.

	A	B	C
1	Student Name	Total	
2	Aisha	85	
3	Bilal	78	
4	Charu	92	
6	Total	255	

8 Review and Save

Check your table, make corrections and save your file.



COMMON CALCULATIONS IN TABLE

Σ	SUM	=SUM(range)	Adds values
$\bar{x}$	AVERAGE	=AVERAGE(range)	Finds average
I	COUNT	=COUNT(range)	Counts numbers
V	MAX	=MAX(range)	Finds highest value
T	MIN	=MIN(range)	Finds lowest value

Font

Calibri 11
B I U
Change font style, size, color.

Alignment

Align text left, center, right, top, middle.

Number

General
\$ % + 0.00
Change number, date, currency formats.

Styles

Cell Styles
Apply cell styles and fill colors.

Borders

Add or remove borders to cells.

SUMMARY

Preparing a good table in a spreadsheet means:

- Entering accurate data
- Using clear headings
- Formatting properly
- Calculating and reviewing results

This makes your data organized, professional and ready for analysis.

Student Marks Table						
Roll No.	Name	English	Maths	Science	Total	Average
1	Aisha	85	90	88	263	87.67
2	Bilal	78	82	80	240	80.00
3	Charu	92	95	90	277	92.33
Total		255	267	258	780	86.67



REMEMBER: A well prepared table is the first step to getting accurate results and meaningful insights from your data!



SPREADSHEET CHARTS

Visualize Data • Identify Trends • Make Better Decisions



Charts in a spreadsheet application convert data into graphical representations like bars, lines, pies, etc. They make complex data easier to understand and help in quick analysis and comparison.

EXAMPLE DATASET

Monthly Sales Report (in ₹)

Month	Product A	Product B	Product C	Total Sales
Jan	2,500	1,800	2,000	6,300
Feb	2,800	2,000	2,200	7,000
Mar	3,200	2,400	2,600	8,200
Apr	2,900	2,200	2,400	7,500
May	3,600	2,800	3,000	9,400
Jun	4,000	3,000	3,200	10,200

→ We can create charts from this data to visualize it.

BENEFITS OF USING CHARTS

- ✓ Make data easy to understand
- ✓ Identify patterns and trends quickly
- ✓ Compare values and performance
- ✓ Enhance presentations and reports
- ✓ Support better decision making

STEPS TO CREATE A CHART (Excel / Google Sheets)

- Select the Data**
Select the range of cells (including headings) you want to represent in the chart.
- Insert Chart**
Go to Insert tab → Chart (Choose the chart type you want.)
- Customize the Chart**
Add chart title, axis titles, legends, data labels, change colors and styles.
- Move / Resize Chart**
Place the chart in the worksheet or in a separate chart sheet. Adjust the size as needed.
- Update Chart**
When data changes, the chart updates automatically.

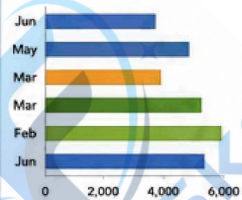
COMMONLY USED CHART TYPES

1. Column Chart



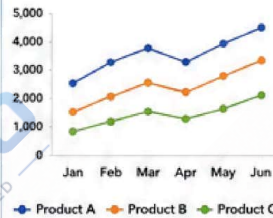
Compare values across categories.

2. Bar Chart



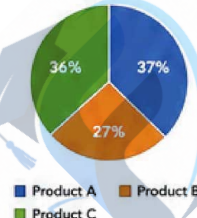
Compare values across categories (horizontal view).

3. Line Chart



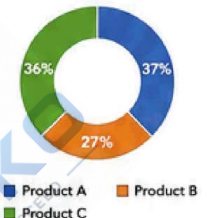
Show trends over time.

4. Pie Chart



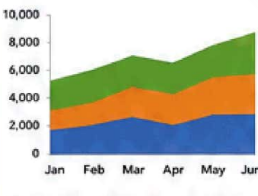
Show proportion of a whole.

5. Doughnut Chart



Similar to pie chart with hollow center.

6. Area Chart



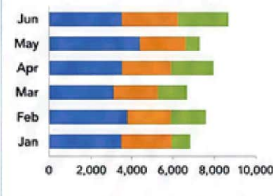
Show volume and trends over time.

7. Stacked Column Chart



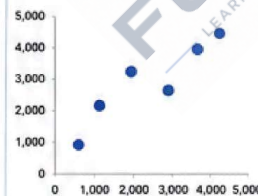
Show part-to-whole comparison.

8. Stacked Bar Chart



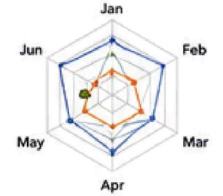
Show part-to-whole comparison (horizontal).

9. Scatter Chart (XY)



Show relationship between two variables.

10. Radar Chart



Compare multiple variables across categories.

KEY FEATURES OF CHARTS

- Chart Title**: Give a clear and meaningful title to your chart.
- Axis Titles**: Name the X-axis and Y-axis for better understanding.
- Legend**: Shows what each color or line represents.
- Data Labels**: Display exact values on bars, slices or points.
- Colors & Styles**: Use colors and styles to make charts attractive and clear.
- Filters**: Show only the required data in the chart.

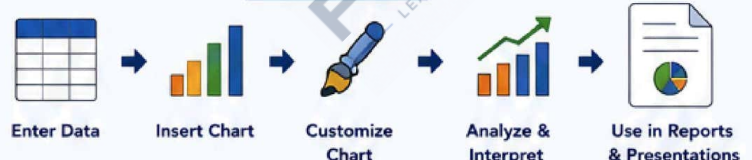
TIPS FOR EFFECTIVE CHARTS

- Choose the Right Chart**: Select a chart type that best fits your data and message.
- Keep it Simple**: Avoid too many colors, effects or 3D unless necessary.
- Highlight Important Data**: Use data labels or colors to highlight key points.
- Ensure Accuracy**: Always check your data and scale for accurate representation.
- Update Regularly**: Keep charts updated when data changes.

REAL-WORLD USES

- Business**: Sales analysis, profit comparison, performance tracking
- Education**: Student performance, attendance, results analysis
- Finance**: Budgeting, expense tracking, investment analysis
- Marketing**: Campaign performance, customer analysis
- Projects**: Project progress, resource usage, timeline tracking

SUMMARY



REMEMBER: Good charts turn numbers into insights and insights into better actions!





SPREADSHEET SORTING

Organize Data • Find Information Faster • Make Better Decisions



Sorting arranges data in a specific order (A to Z, Z to A, Smallest to Largest, Largest to Smallest, Oldest to Newest, etc.) It helps to organize data and makes it easier to analyze.

EXAMPLE DATASET

Student Marks List

Roll No.	Student Name	Class	Marks (%)
101	Zoya Khan	10	78
102	Arjun Patel	10	92
103	Neha Singh	10	65
104	Rohan Verma	10	88
105	Aisha Gupta	10	72
106	Kabir Sharma	10	95

We can sort this data by:

- Student Name (A to Z / Z to A)
- Marks (%) (Low to High / High to Low)
- Roll No. (Small to Large / Large to Small)

BENEFITS OF SORTING

- ✓ Find data quickly and easily
- ✓ Identify highest/lowest values
- ✓ Organize data for better analysis
- ✓ Improve report readability
- ✓ Save time and increase efficiency

STEPS TO SORT DATA (Excel / Google Sheets)

- Select the Data Range**
Select the cells including the headers of the data you want to sort.
- Open Sort Option**
Go to the Data tab → Sort (or click the Sort A to Z / Z to A button on the toolbar).
- Choose Sort Criteria**
Select the column to sort by. Choose the order: A to Z, Z to A, Smallest to Largest, or Largest to Smallest.
- Add Level (Optional)**
Click 'Add Level' to sort by another column (useful for sorting data with multiple criteria).
- Click OK / Sort**
Your data will be sorted according to the selected order.

EXAMPLES OF SORTING

1. Sort by Student Name (A to Z)

Roll No.	Student Name	Class	Marks (%)
105	Aisha Gupta	10	72
102	Arjun Patel	10	92
106	Kabir Sharma	10	95
103	Neha Singh	10	65
104	Rohan Verma	10	88
101	Zoya Khan	10	78

Arranged alphabetically (A to Z) by Student Name.

2. Sort by Marks (%) – High to Low

Roll No.	Student Name	Class	Marks (%)
106	Kabir Sharma	10	95
102	Arjun Patel	10	92
104	Rohan Verma	10	88
101	Zoya Khan	10	78
105	Aisha Gupta	10	72
103	Neha Singh	10	65

Arranged from highest to lowest marks.

3. Sort by Marks (%) – Low to High

Roll No.	Student Name	Class	Marks (%)
103	Neha Singh	10	65
105	Aisha Gupta	10	72
101	Zoya Khan	10	78
104	Rohan Verma	10	88
102	Arjun Patel	10	92
106	Kabir Sharma	10	95

Arranged from lowest to highest marks.

CUSTOM SORT (MULTIPLE CRITERIA)

Example: Sort by Class (Small to Large), then by Marks (High to Low)

Roll No.	Student Name	Class	Marks (%)
106	Kabir Sharma	9	93
104	Rohan Verma	9	85
101	Zoya Khan	9	75
102	Arjun Patel	10	92
105	Aisha Gupta	10	72
103	Neha Singh	10	65

First sorted by Class (9 before 10).

Within the same class, sorted by Marks (High to Low).

SORT DIALOG BOX (Example: Excel)

Sort

⊕ Add Level ✕ Delete Level 📄 Copy Level ^ v Options... ☐ My data has headers

Column	Sort On	Order
Sort by: Class	Cell Values	Smallest to Largest
Then by: Marks (%)	Cell Values	Largest to Smallest

OK Cancel

Add multiple levels to sort by more than one column.

QUICK SORT TOOLS (Toolbar)



Sort A to Z (Ascending)



Sort Z to A (Descending)



Sort Smallest to Largest



Sort Largest to Smallest

THINGS TO REMEMBER

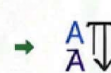
- ✓ Always select the full data range including headers.
- ✓ Sorting affects the entire row, not just one column.
- ✓ Check for blank cells; they may move to top or bottom.
- ✓ Use Custom Sort for accurate multi-level sorting.
- ✓ You can undo sorting if needed (Ctrl + Z).

WHERE TO FIND SORT OPTION

Data Tab (Excel / Google Sheets)



Data Tab



Sort



Sort Dialog



SUMMARY:

Sorting in a spreadsheet helps arrange data in a meaningful order, making it easier to read, analyze and present information effectively.





RUNNING STATISTICAL APPLICATIONS IN EXCEL AND LIBREOFFICE CALC

Analyze Data • Discover Insights • Make Better Decisions



Excel and LibreOffice Calc provide powerful statistical tools to summarize, analyze and interpret data using built-in functions, Data Analysis tools and charting features.

BENEFITS

- ✓ Quick and easy data analysis
- ✓ Accurate calculations
- ✓ Clear presentation of results
- ✓ Supports decision making
- ✓ Saves time and improves productivity

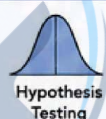
WHAT YOU CAN DO



Descriptive Statistics



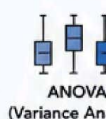
Correlation & Regression



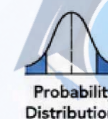
Hypothesis Testing



Frequency Analysis



ANOVA
(Variance Analysis)

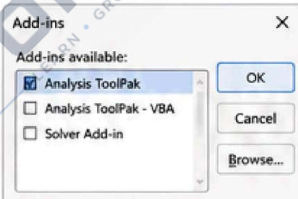


Probability Distributions

A. RUNNING STATISTICAL APPLICATIONS IN EXCEL

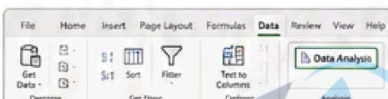
1. Enable Data Analysis ToolPak

- Go to **File** → **Options**.
- Click **Add-ins**.
- At the bottom, select **Excel Add-ins** in **Manage** box and click **Go**.
- Check **Analysis ToolPak** and click **OK**.



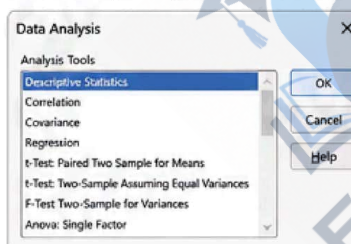
2. Access Data Analysis

Go to the **Data** tab → Click **Data Analysis** in the **Analysis** group.



3. Choose a Statistical Tool

Select the analysis tool you need and click **OK**.



4. Provide Input and Get Results

- Enter **Input Range** (data).
- Choose **output options** (**Output Range**, **New Worksheet Ply**, or **New Workbook**).
- Click **OK**.
- Results will be generated automatically.

Descriptive Statistics	
Mean	72.45
Median	71.00
Mode	68.00
Standard Deviation	8.94
Sample Variance	79.84
Minimum	55.00
Maximum	90.00
Count	20

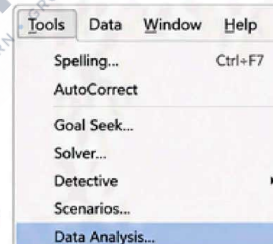
Example (Descriptive Statistics)

Marks
55
68
72
80
90
...

B. RUNNING STATISTICAL APPLICATIONS IN LIBREOFFICE CALC

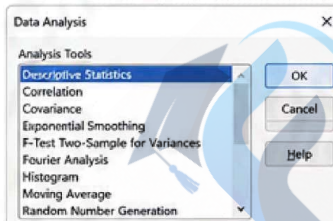
1. Access Data Analysis

Go to **Tools** → **Data Analysis** (or click the **Data Analysis** icon  in the toolbar).



2. Choose a Statistical Tool

Select the analysis tool from the list and click **OK**.



3. Provide Input and Options

- Select **Input Range**.
- Choose options for **Grouped By**, **Labels**, **Confidence Level**, etc.
- Choose **Output options** (**Output Range**, **New Sheet**, or **New Document**).
- Click **OK** to get results.

4. View Results

Results will be displayed in the selected location.

Descriptive Statistics	
Mean	72.45
Median	71.00
Mode	68.00
Standard Deviation	8.94
Sample Variance	79.84
Minimum	55.00
Maximum	90.00
Count	20

Example (Descriptive Statistics)

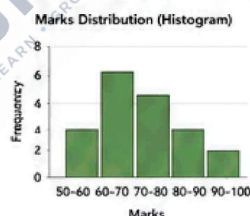
Marks
55
68
72
80
90
...

COMMON STATISTICAL TOOLS AND THEIR USES

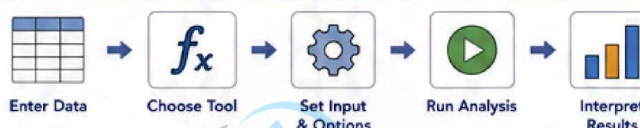
Tool	What it Does	When to Use
Descriptive Statistics	Provides summary statistics (mean, median, mode, SD, variance, min, max, count, etc.)	To summarize and describe a dataset
Correlation	Measures the strength and direction of relationship between two variables	To see how two variables are related
Regression	Analyzes the relationship between dependent and independent variables	To predict values and model relationships
t-Test	Tests if the means of two groups are significantly different	To compare means of two groups
ANOVA	Tests if there are differences among the means of three or more groups	To compare means of multiple groups
Histogram	Shows the frequency distribution of data in a chart	To understand the distribution and shape of data
F-Test	Compares the variances of two populations	To test equality of variances

EXAMPLE OUTPUT (DESCRIPTIVE STATISTICS)

Statistic	Excel	LibreOffice Calc
Mean	72.45	72.45
Median	71.00	71.00
Mode	68.00	68.00
Standard Deviation	8.94	8.94
Sample Variance	79.84	79.84
Minimum	55.00	55.00
Maximum	90.00	90.00
Count	20	20



EXAMPLE: QUICK WORKFLOW



IMPORTANT TIPS

- ✓ Ensure your data is clean, complete and organized.
- ✓ Include labels in the first row or column.
- ✓ Check the output carefully and interpret results in context.
- ✓ Use charts along with statistics for better insights.
- ✓ Save your work for future reference.



CONCLUSION

Excel and LibreOffice Calc are powerful tools for performing a wide range of statistical analyses. With built-in features and easy-to-use interfaces, you can analyze data, uncover patterns and make data-driven decisions efficiently.



REMEMBER: Good analysis leads to better insights. Practice with data and explore different tools to become more confident!



CREATING FORMULAE IN SPREADSHEETS



Formulas are equations used to perform calculations on data in a worksheet. They begin with an equal sign (=) and can include cell references, operators, functions and constants.

EXAMPLE DATASET

Student Marks Sheet

	A	B	C	D	E	F
	Roll No.	Name	Maths	Science	English	Total
2	1	Aisha	85	90	78	=C2+D2+E2
3	2	Bilal	72	80	68	=C3+D3+E3
4	3	Charu	92	88	95	=C4+D4+E4
5	4	Danish	65	70	60	=C5+D5+E5
6	5	Esha	78	85	80	=C6+D6+E6

Total (F column)

Adds marks of Maths, Science and English.

Formula in F2: =C2+D2+E2

Average (G column)

Calculates average of Total marks.

Formula in G2: =F2/3

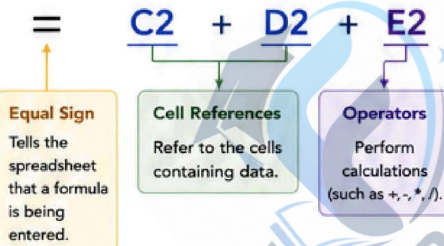
STEPS TO CREATE A FORMULA

- Select the Cell**
Click the cell where you want the result to appear.
- Type Equal Sign**
Begin the formula with an equal sign (=).
- Enter the Formula**
Type the formula using cell references, operators, functions and/or constants.
- Press Enter**
Press Enter. The result will be displayed in the cell.
- Copy the Formula**
Use the fill handle (small square) to copy the formula to other cells.

Formula Bar

You can view, edit or type formulas in the formula bar located above the worksheet.

COMPONENTS OF A FORMULA



OPERATORS IN FORMULAE

Operator	Meaning	Example	Result
+	Addition	=C2+D2	170
-	Subtraction	=C2-D2	-5
*	Multiplication	=C2*D2	7650
/	Division	=C2/D2	0.94
^	Exponent	=C2^2	7225
%	Percent	=C2*10%	8.5

TYPES OF CELL REFERENCES

Relative Reference (Default)	=C2+D2	Changes when copied to another cell.
Absolute Reference	= \$C\$2 + \$D\$2	Remains fixed when copied.
Mixed Reference	= C\$2 + \$D2	Row or column remains fixed.

Use \$ before column letter and/or row number to make a reference absolute.

COMMONLY USED FUNCTIONS

Σ SUM Adds numbers. =SUM(C2:C6) Adds values in C2 to C6.	$\bar{x}$ AVERAGE Finds the average. =AVERAGE(C2:E2) Average of values in C2 to E2.	# COUNT Counts numbers. =COUNT(C2:C6) Counts numeric values in C2 to C6.	MAX Finds the largest value. =MAX(C2:C6) Largest value in C2 to C6.	MIN Finds the smallest value. =MIN(C2:C6) Smallest value in C2 to C6.
--	--	---	---	---

EXAMPLE: USING FUNCTIONS

	A	B	C
1	Item	Quantity	Price (₹)
2	Pen	10	15
3	Book	5	120
4	Notebook	8	40
5	Total	=SUM(B2:B4)	=SUM(C2:C4)

Total Quantity: =SUM(B2:B4)
Total Price: =SUM(C2:C4)

EXAMPLES OF CREATING FORMULAE

1	Add numbers	=10+20	Result: 30
2	Add cell values	=C2+D2	(Adds values in C2 and D2)
3	Multiply	=B2*5	(Multiplies value in B2 by 5)
4	Percentage	=C2*10%	(10% of value in C2)
5	Total Marks	=C2+D2+E2	(Total of three subjects)
6	Average Marks	=AVERAGE(C2:E2)	(Average of three subjects)

FORMULA EXAMPLE WITH RESULT

C	D	E	F	F
Maths	Science	English		Total
85	90	78	=C2+D2+E2	253
72	80	68	=C3+D3+E3	220
92	88	95	=C4+D4+E4	275
65	70	60	=C5+D5+E5	195
78	85	80	=C6+D6+E6	243

Copy the formula down using the fill handle to get results for all rows.

TIPS

- Always start formulas with =
- Use cell references instead of typing values directly. It makes your formula flexible.
- Use brackets () to control the order of operations. Example: =(C2+D2)*E2
- Check for errors and correct them. Example: #DIV/0! means division by zero.
- Use meaningful names for ranges or cells (Name Manager) for easy formulas.

COMMON FORMULA ERRORS

#DIV/0!	Division by zero or cell is empty in divisor.
#VALUE!	Wrong type of argument or mismatched data types.
#NAME?	Excel/Calc doesn't recognize text (wrong function name).
#REF!	Invalid cell reference.
#####	Column too narrow to display the result.

KEY TAKEAWAY

Formulas make spreadsheets powerful. They help you perform calculations, analyze data and save time. Learn, practice and explore functions to become more efficient!



REMEMBER:

Practice regularly, use references and functions wisely, and your spreadsheets will do the hard work for you!

