Chapter1

First-generation hardware(1951-1959):

Vacuum tubes: used In CPU(central processing unit) for i/o

Magnetic drum: used to get information instantly

Magnetic tape drivers: used to store information

Second-generation hardware(1959-1965)

Transistor: Replaced vacuum tube, fast, small, durable, cheap

Magnetic cores: Replaced magnetic drums to get information instantly

Magnetic disk: replaced magnetic drivers so information can be accessed directly

Third generation hardware(1965-1971):

Integrated circuits: Replaced circuit boards, smaller, cheaper, faster, more reliable

Transistors: now used for memory construction

Terminal: an I/o device with keyboard and display

Fourth-generation hardware(1971-?)

VLSI(very large scale integration): Great advances in chip technology

PCs, the Commercial Market, Workstations: Personal Computers and Workstations emerge New companies emerge: Apple, Sun, Dell …

Laptops, Tablet Computers, and Smart Phones

First-generation software

Usually, computers understand only 0's and1's, so there is assembly language that can be understood by us and it will be converted in 0's and 1's with a translator and there are two types of programmers they are **application programmer** and **system programmer**

Second generation software

High-level languages English like the statement made it easy for the programmers easy to understand and some of the languages are Fortron, COBOL, lisp

Third generation software

In third-generation software there is system software that will be overlapping high-level languages operating system will tell which program to run and when and consist of a translator in it to convert to high-level language computer programmers write in a way that it can be used by the general public

Fourth-generation software

Structured programming like c++ and there are new computer software like a word processor, DBMS

Fifth-generation software

Nowadays Microsoft is more dominating the market with its operating system and other things and users need no knowledge of computing for controlling computer

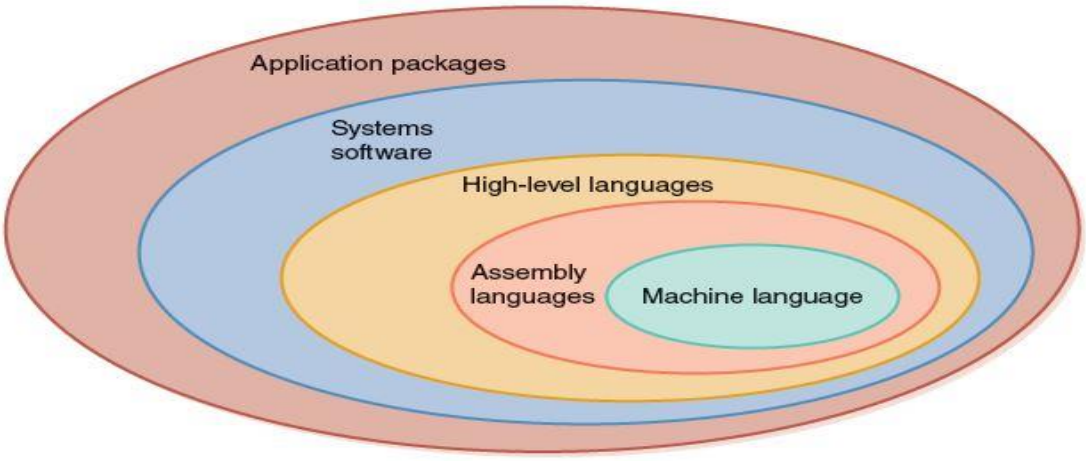


FIGURE 1.10 The layers of software surrounding the hardware continue to grow

Four necessary skills for computing

- Algorithmic thinking
- Representing
- Programming
- Design

Computing components (2C)

Power of 10	Power of 2	Value of Power of 2	Prefix	Abbreviation	Derivation
10^{-12}			pico	p	Italian for *little*
10^{-9}			nano	n	Greek for *dwarf*
10^{-6}			micro	μ	Greek for *small*
10^{-3}			milli	m	Latin for *thousandth*
10^{3}	2^{10}	1024	kilo	K	Greek for *thousand*
10^{6}	2^{20}	1,048,576	mega	M	Greek for *large*
10^{9}	2^{30}	1,073,741,824	giga	G	Greek for *giant*
10^{12}	2^{40}	not enough room	tera	T	Greek for *monster*
10^{15}	2^{50}	not enough room	peta	P	Greek prefix for *five*

How does a CPU(central processing unit) work:

First, the input will be taken from the input device like keyboard, mouse, etc… and will be sent to the **memory** to store the given input, then the input will be sent to the **cu(control unit)** usually it performs i/o and take commands and execute them in the CPU if any arithmetic calculation required then the input will be sent to the **ALU(arithmetic logic unit)** it will perform the functions like +,-,*,/ and again it will be sent back to the CU and it will be sent to the **output** devices like printer or display.

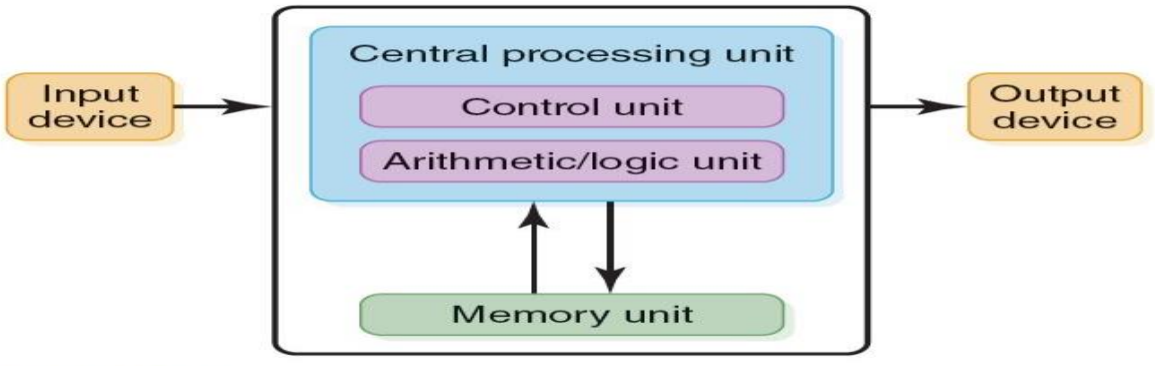


FIGURE 5.1 The von Neumann architecture.

Most of the modern cu/logic have storage known as "**Registers**" which can be accessed easily and fastly

- Both cu and ALU are known as CPU
- IR(Instructor register): IR contain the instructions which are to be executed
- Programme counter: program counter contain the information which should be executed next

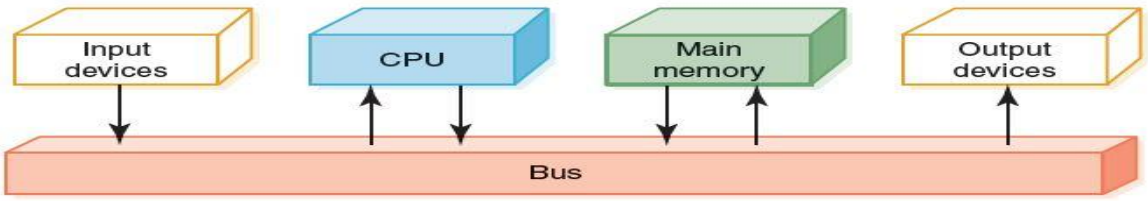


FIGURE 5.2 Data flow through a von Neumann machine

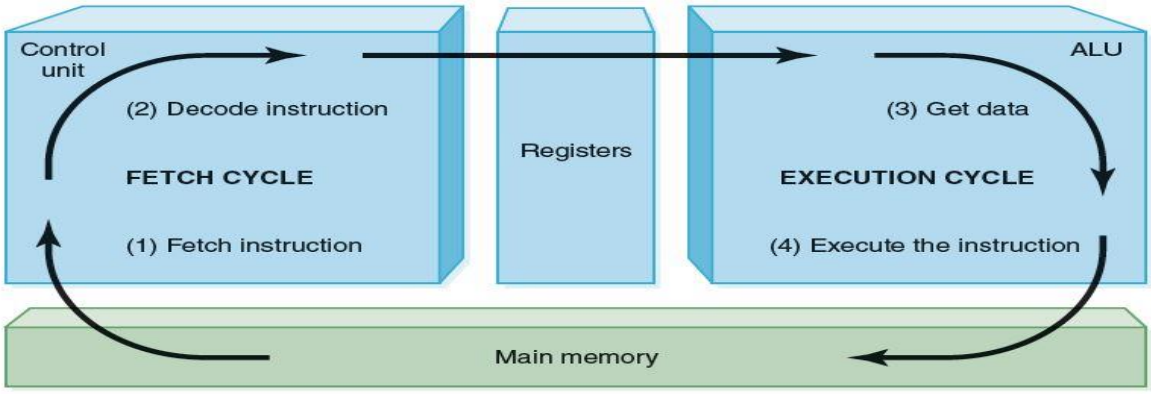


FIGURE 5.3 The fetch–execute cycle

RAM(Random access memory): ram will help to find the information and we can change it

Rom(read-only memory): in rom, we can access memory but can change the information

Ram is volatile but Rom is not volatile

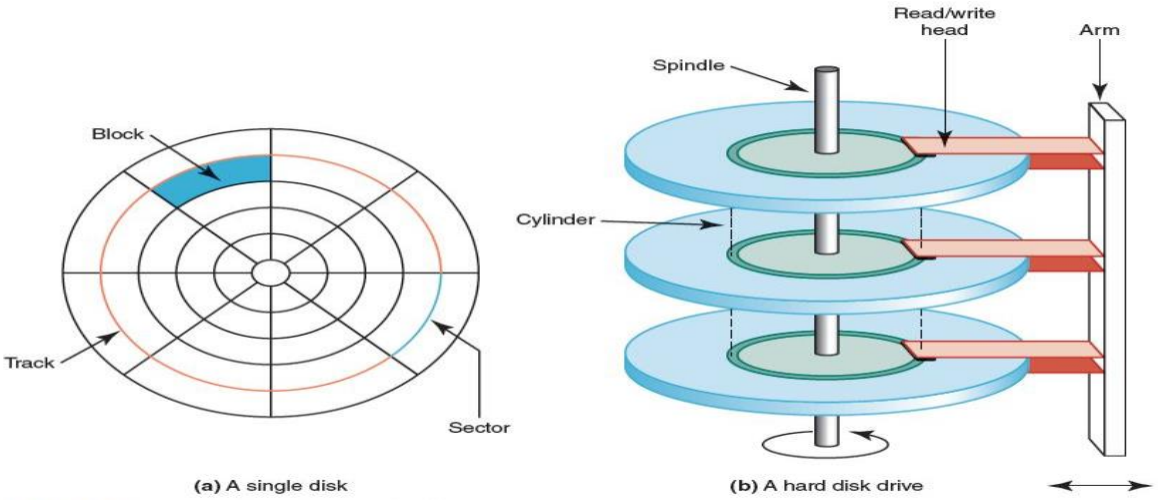


FIGURE 5.5 The organization of a magnetic disk

CD

A compact disk that uses a laser to read information stored optically on a plastic-coated disk; data is evenly distributed around the spiral track

CD-ROM read-only memory

CD-DA digital audio

CD-WORM write once, read many

RW or RAM both read from and written to

DVD(digital versatile disk): a disk that stores the audio and video

Blue-ray: which will store high-resolution video and audio

There are four types of screens :

1. Resistive touch screen
2. Infrared touch screen

3. Saw(Surface acoustic wave
4. Capacitive touch screen

Embedded systems

a microprocessor-based computer hardware system with software that is designed to perform a dedicated function

OPERATING SYSTEM

User interface: interface between the user

Kernel: is The core of the OS. Interacts with the BIOS (at one end), and the UI (at the other end).

Multiuser: two or more users using the computer at the same time

Multitasker: two or more processes running at the same time

Multithreading: two or more parts of the same process running at the same time

DOS(DISK OPERATING SYSYTEM)

Dos is the first OS used in computers in 1981 in dos there will be only one command line and it is not a multitasking system and it is directly connected to the bios.

The file is given a name for easy understanding and the file system will help to find where the file is in the disk usually disks are subdivided into directories and folders

- The top level of the folder is known as root and it is subdivided into subfolders
- **c:\courses\061\cit141\chapter4.ppt**
- This is a fully qualified name with the path in it

xcopy /m/e c:\temp d:\temp

Command Name

DOS Wildcard Characters

- The characters ? and * can be used to affect multiple files with a single command.
  - The ? means any single character.

    copy c:\temp\notes??.doc d:\temp

    means copy any Word file that begins with the word "notes" with exactly two other characters, like "notes01.doc", "notesAB.doc", etc.

DOS Wildcard Characters

- The "*" wildcard replaces any number of characters.

  copy c:\temp\notes.* d:\temp
  (copy all files with the name "notes" and any extension.)

  copy *.doc c:\temp
  (copy all files with a "doc" extension in the current directory.)

At the Command Prompt

- A drive letter and a ":" (e.g. "f:") makes that your current drive.
- CD (Change Directory)
  - cd (with no parameters) reminds you what the current directory is.
  - cd .. moves you to the parent of the current directory (up one level).
  - cd \ moves you to the root of the current drive.
  - cd <some directory> makes that your current directory.

DOS Commands

- MD – Make directory.
- RD – Remove a directory or an entire directory tree.
- DIR – Display the contents of a directory.
- DEL (or ERASE) – Deletes one or more files.
- COPY – Places a copy of file(s) in a different folder.
- XCOPY – Flexible copy command used for copying large groups of files, commonly used for file backup.
- **"DOS" is a "Retired Candidate". DOS really doesn't exist anymore as standalone OS. It's a command prompt.**

More DOS Commands

- MOVE – Moves file(s) from one folder to another.
- REN(AME) – Renames file(s).
- ATTRIB – Displays or sets file attributes.
- FORMAT – Formats a disk.
- CHKDSK – Tests the file system on a disk, and reports status.

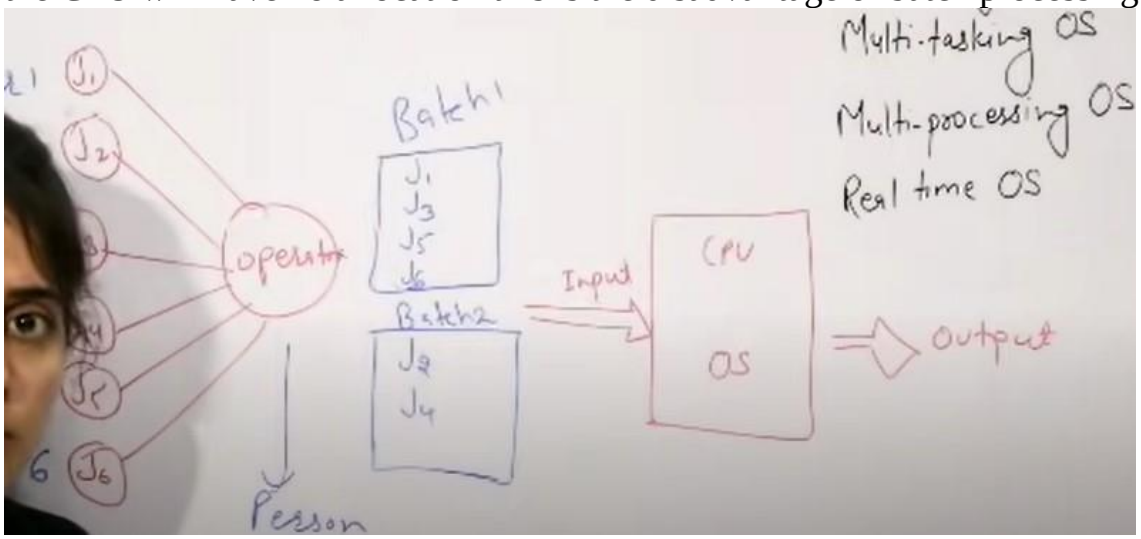
Even More

- DATE and TIME – Display & set the current date & time in the PC.
- TYPE – Displays the contents of a text file.

What is a batch processing system?

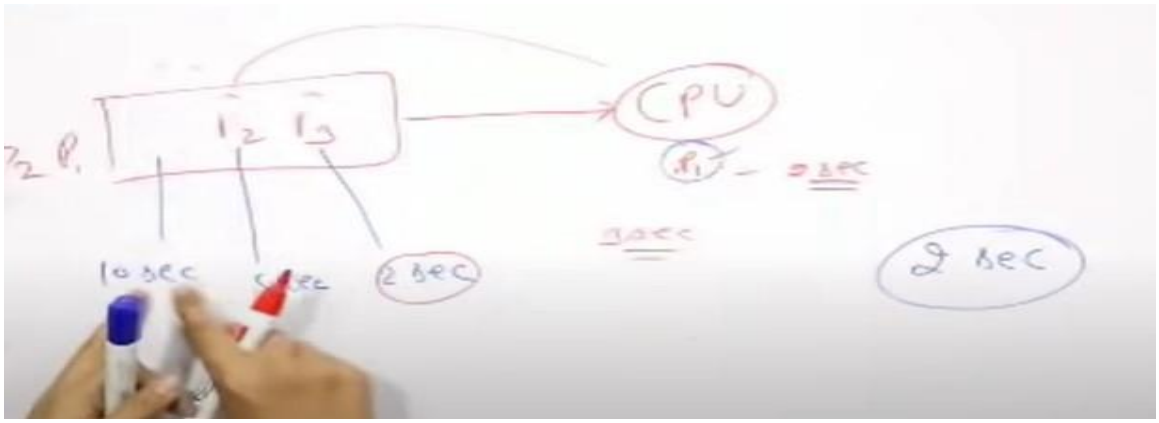
Batch processing is a type of system where similar kinds of jobs will be done in batches in batch processing if one batch is completed or gone for asking i/o then

the CPU will have no allocation this is the disadvantage of batch processing



What is the time-sharing system?

In the time-sharing system a specific time will be given for each process for example: if the user gave 2s for each process and now there are 3 processes in queen then p1 will be taken first and the process will be done for 2sec if any time is required for the process it will go back to the queue and the next process will be executed

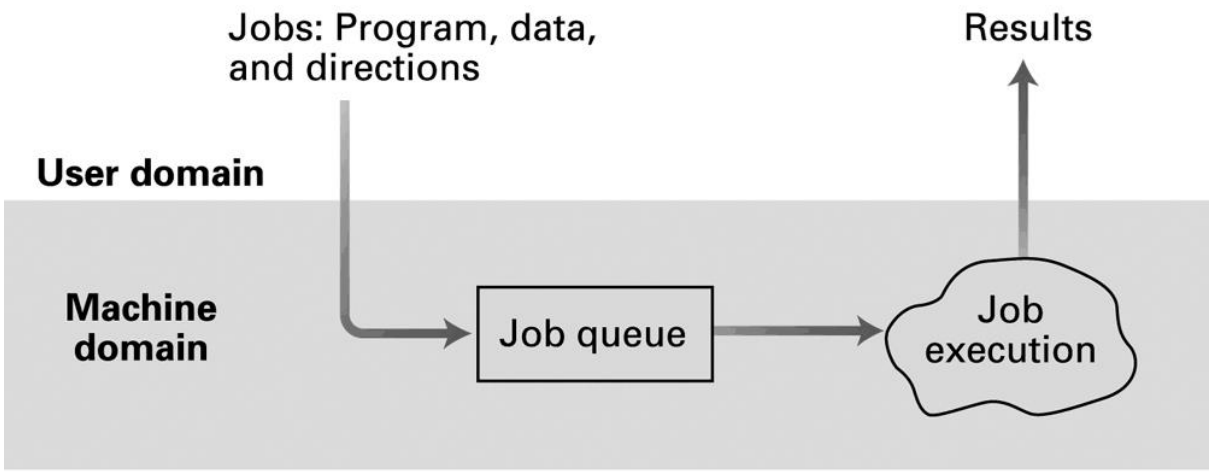


What is real-time processing?

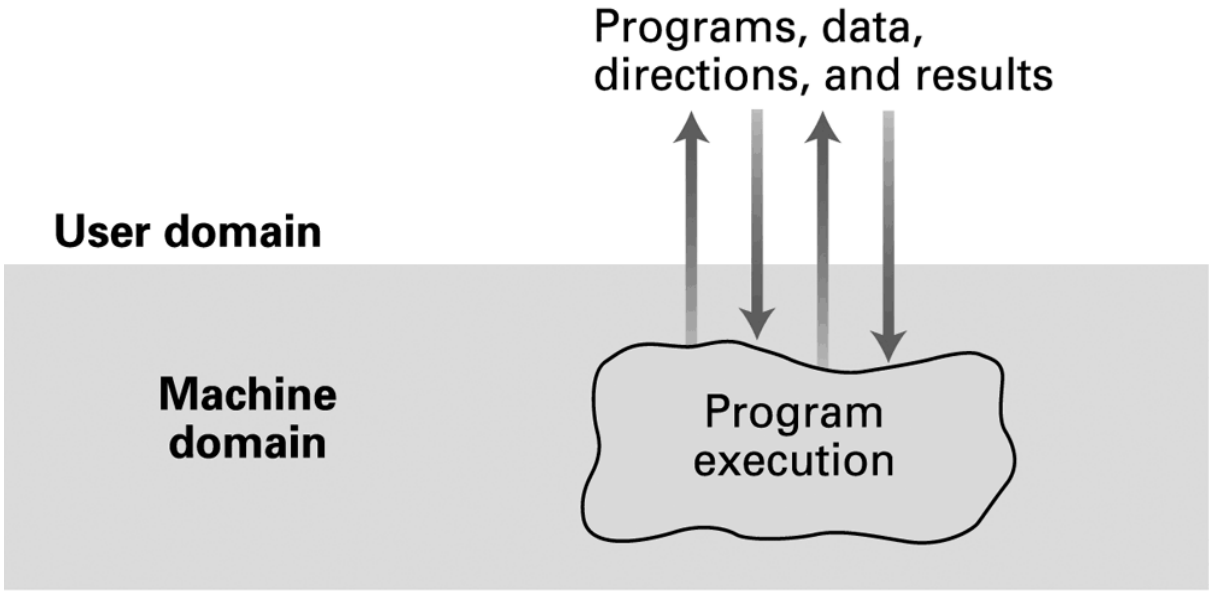
A specific time will be given to complete the process I mean the process should be completed in the given time this is used in rocket launching and ex…..

CHECK OUT THE PPT 3B TO KNOW MORE ABOUT INTEREPTS

BATCH PROCESSING



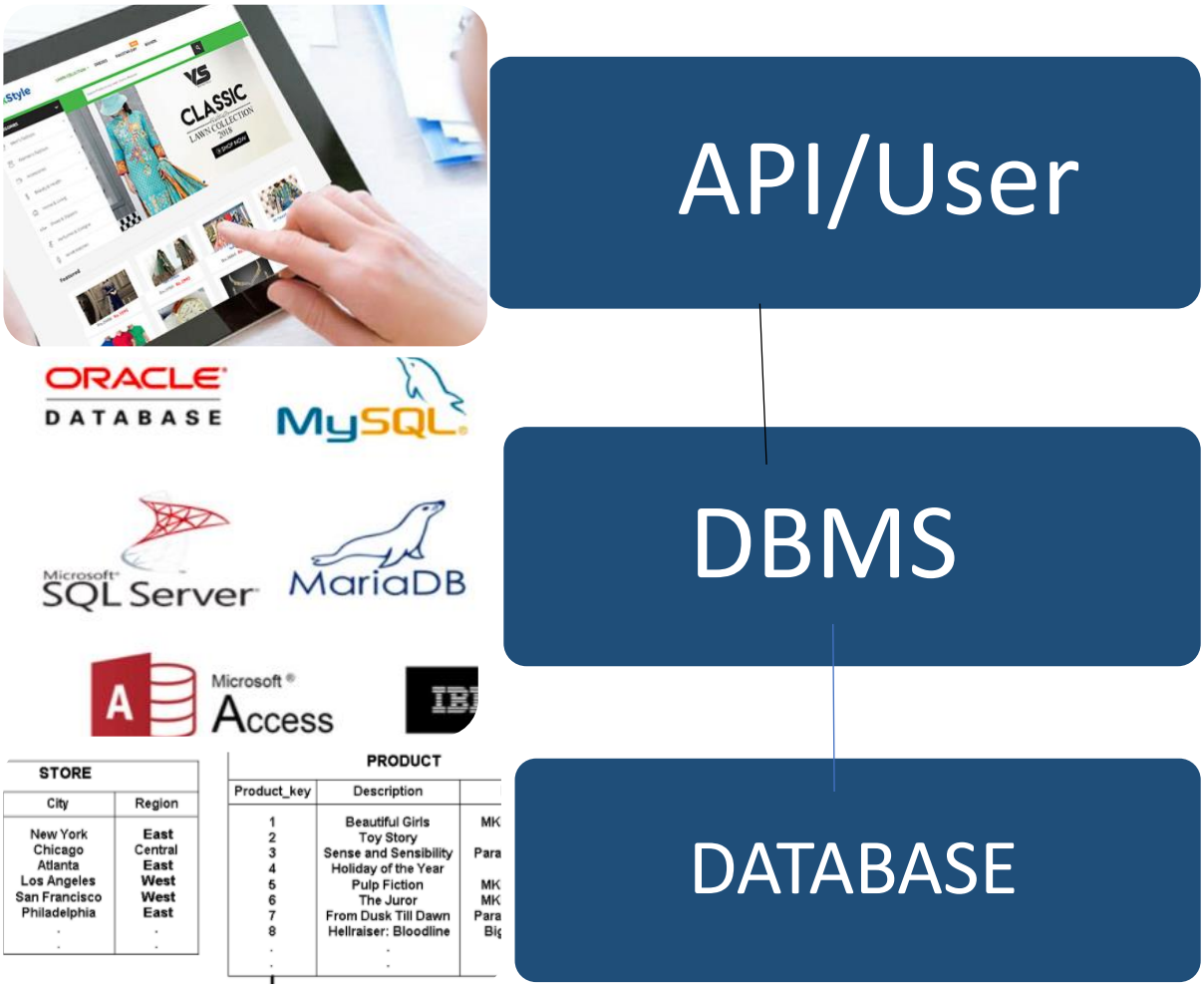
INTERACTIVE PROCESSING



DBMS(DATABASE MANAGEMENT SYSTEM)

SO WHAT IS A DATABASE?

The database is a collection of interrelated data



What is an API?

API means application programming interface which helps us access data from a database indirectly for example Zomato boys will have appeared on maps in the Zomato app how is this possible? Zomato request google maps through API here API works as a request controller

What is DBMS?

DBMS(database management system) is software that helps us to manage the data from the database

Some of the examples of the databases are oracle and etc

DATABASE IS ORGANISED DATA THAT CAN BE ASSESSED AND MANAGED EASILY

Bases	DBMS	Flat file system
Definition	DBMS is a collection of interrelated data and software programs to access those data.	Flat file system stores data in a plain text file. Here, the records are specified in a single line.
Data redundancy	There is no problem of data redundancy.	There is main problem of data redundancy.
Cost	DBMS software are very costly and also regular update makes it costly.	Flat file are cost effective.
Use	Mostly, large organizations use DBMS who can afford it and have a large number of client and employees to be managed.	Small organizations use it as it is cost effective and who have to deal with small number of clients and employees.
Views	Views are created and an employees can't see all information available, hence there is security.	Any information can be seen by anyone, hence there is no security.