

Computer Generations:-

- Computers developed after 1946 are categorized into five generations.

1) First Generation Computers:- developed during 1946-59.

- built with Vacuum tubes
- Speed was 10^3 sec. machine language programming used.
- had limited primary memory & used magnetic drums as secondary storage devices.
- used punch cards & magnetic tapes for input & output operations.

Ex:- ENIAC, UNIVAC-I, EDSAC, EDVAC, etc.

2) Second Generation Computers:-

- developed during 1957-64 & built with diodes & transistors.

- Speed: 10^6 sec
- had more primary memory & proved higher reliability.
- used high level languages like FORTRAN, Pascal, ALGOL, etc.

Ex:- BURROUGHS 5000, IBM 1401, HONEYWELL 400, etc.

3) Third Generation Computers:-

- developed during 1965-70 & built with ICs.

- Speed: 10^9 sec
- used semiconductor memory.
- higher reliability & reduced size.
- introduced concept of operating system, multi-programming, parallel processing, etc.
- used in weather forecasting, airline reservations, etc.

Eg: IBM System/360, NCR 395, CYBER-175, etc.

② 4) Fourth Generation Computers:-

- developed during 1970-90.
- built with Large Scale Integration (LSI), 100-1000 transistors in single chip.
- huge storage capacity & speed: 10^{-9} - 10^{-12} sec.
- networking concept introduced.

Ex:- IBM 3033, HP-3000, etc.

5) Fifth Generation Computers:-

- main motivation is development of Super Computers.
- developed with Super Large Scale Integration (SLSI), million transistors per chip
- C-concepts like artificial intelligence & distributed processing are introduced.
- Introduced CDROM, WORM (write once Read many times)

Ex:- CRAY machines (Japan), PARAM (India), etc.

* Computer Types:- Categorization of Computers:-

based on - principle of working

- size & capacity
- processors & storage.

1) based on principle of working

- 1) Analog Computers - process data that occurs in a continuous flow such as temperature, pressure,
- 2) Digital Computers - used to process alpha-numeric & graphical data.
- 3) Hybrid - Combination.

Comparison table

Factors	Analog Computers	Digital Computers
i) Input	physical variables	Alphanumeric
ii) processing (operations)	Integration	Arithmetic & logical
iii) Output	Graphical	Numeric & graphical
iv) Memory unit	normally not required	Necessary to store data & instructions
v) Accuracy	Limited	high
vi) Processor	OPAMP	Microprocessor
vii) Application	simulating physical sys	for solving scientific & mathematical problems

II) 1) Computers for individual users.

2) Computers for organizations.

→ six types. i) Desktop computers - independent PC designed to sit on desk.
- table type desktop & tower type.

ii) Work stations:
specialized single user computer, used for to perform sophisticated ~~to~~ group of tasks such as engg. applns (CAD/CAM), 3D graphics, animations, etc.
- they have high processing power & high quality graphics handling capability.

iii) Notebook computers: - (Laptops).

iv) Tablet PCs: - Small sized notebooks.

v) Hand-held PCs: - Small computer devices.
Ex PDA. (like diary).

vi) Smart phones: -

II. 2) Computers for organizations:

these are to be used by schools, banks, depts, etc to support multiple users for variety of tasks at a time.

4-types:-

1) Network Servers :- is a powerful personal computer with special hardware & software to enable multiple users to access the s/m simultaneously.

2) Mainframe Computers :- used in large business organizations, industrial & research institutes, universities, etc.
- Mainframe computer is a very large computer s/m that will occupy a huge room & it is connected to desktop computers & mini computers which are located either near / far from main computer.

3) Mini Computer :- medium-sized computer systems that occupy rooms. these are multi-user s/ms.

4) Super Computers :-
- very powerful computers.
- used for applications involving intense computations such as weather forecasting design of aircraft wings, defense activities etc.

* Computer Types :-

I) According to purpose :-

- 1) General purpose computer - multipurpose computers.
Same computer can be used for typing, game, video, etc.
- 2) Special purpose computer - for specific task.
Ex:- Computer for weather station, simulators, etc.

II) According to technology used

- 1) Analog computers :- Special purpose computers that process & store continuously varying physical quantities such as current, voltage or frequency.
Ex:- Thermometer, Speedometer, etc.
- 2) Digital Computer :- general purpose, store & process data in discrete form.

3) Hybrid Computers

III) According to size & storage capacity :-

- 1) Super computers :- Super computer is the biggest and fastest computer designed for complex scientific problems or applications.
Eg. mainly used for weather forecasting, nuclear research, real-time animation, etc.
Eg:- CRAY 3, NEC-500, PARAM 9000, etc.

2) Main frame computers :-

- Large & faster computers but small & slower than Super computers. used in centralized location & accessed by number of devices connected to them
- have high mem & can support thousands of users.
 - used in Airline reservations, Banking apps, Railway reservation etc.

③ Eg.: IBM3090, IBM4381, IBM4380, etc.

3) Mini Computers:-

~~Mini~~ medium-scale & generally slower than mainframes.

- allows several users to access these machines.

Eg:- PDP-1, IBM AS/400.

4) Micro computers:-

Smallest digital computer, personal computer

- i) Desktop computers - that can be placed on desk
- ii) workstation - specialized high purpose computer, to perform group of sophisticated tasks.
like CAD/CAM applications, graphics & animations.
- iii) Notebook computers
- iv) Tablet PCs
- v) Hand-held PCs
- vi) smart phones

* Functional units

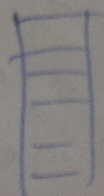
- 1) ALU 2) CU 3) CPU

* Memory:- used to store data & instructions.

- storage to store data & instructions to be processed.

- memory is divided into large no. of small parts - cells.

* Memory types



ⓑ) Dynamic RAM (DRAM) :-

- must be continually refreshed.
- here memory is placed on refresh circuit, that rewrites data several hundred times per second.
- here data lifetime is short.
- slower as compared to SRAM.

2) ROM :- (Read Only memory)

- memory from which we can only read but cannot write.
- non-volatile - info stored permanently during manufacture.
- ROM stores instructions required to start computer.

Types of ROM :-

- 1) Masked ROM (MROM) - hard wired devices - 1st ROM.
- 2) Programmable ROM (PROM) - User can buy empty ROM & burn once.
- 3) Erasable & programmable ROM (EPROM) - can be erased (ultraviolet rays takes 40 mins)
- 4) Electrically " " (EEPROM) - using electricity. takes only 4-10 ms.

II) Secondary memory (Retentive memy).

- non-volatile.
 - slower than main memory.
 - used for permanent data store/retrieval.
- Ex: disk, CD-ROM, DVD, etc.

* Computers in a n/w:
comp nw?

Topology & types: mesh, star, ring, bus.

Types of n/w based on size: LAN, WAN, MAN, PAN

* N/w hardware :-

Components / devices of a network

- 1) Cables
- 2) Distributors
 - L hub
 - L switch
 - L Bridge
- 3) Router
- 4) N/w card

* software? types - Appl'n sw, s/w sw, utility sw.

* Overview of C :- structure of C p/gm.

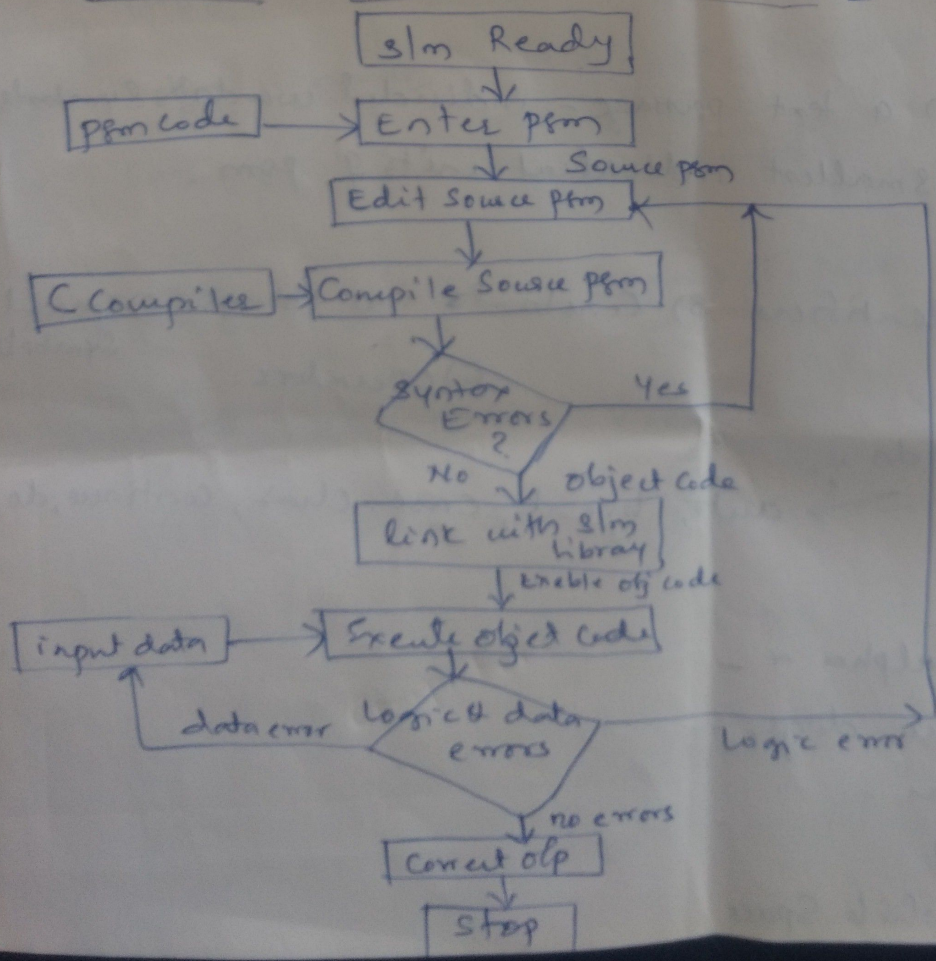
* execution of C p/gm (process)

* Constants, Variables & data types

- Doc. sec
- Link sec
- Defn sec
- Glob dec sec
- main() func sec
- f dec sec
- f exe sec
- sub p/gm sec (UDFs)
- Func 1
- Func 2
- ...
- Func n

- 10 - 0.91
- 9 - 0.82
- 8 - 0.73
- 7 - 0.64
- 6 - 0.55

6/81: 3, 22, 24, 25, 26, 35, 37



Constants, Variables & data types:-

- Character set:- characters that can be used to form words, numbers & expressions.

- Categories
- 1) Letters
 - 2) Digits
 - 3) Special char's
., ! & ^ * - -
 - 4) White Space
blank space
horizontal tab
change return
New line
Form feed

- Trigraph characters:-

many non-english keyboards do not support some characters, hence ANSI C provides some character groups as follows,

<u>Trigraph sequence</u>	<u>translation</u>
??=	#
??[[
??{	{
??!	!
??/	/
??~	~

* C Tokens :- ~~words~~ in a text passage - individual words & symbols.

in C - tokens are smallest individual units of prog.

6 types of tokens

- 1) keywords
- 2) Identifiers
- 3) Constants
- 4) strings
- 5) special symbols
- 6) operators.

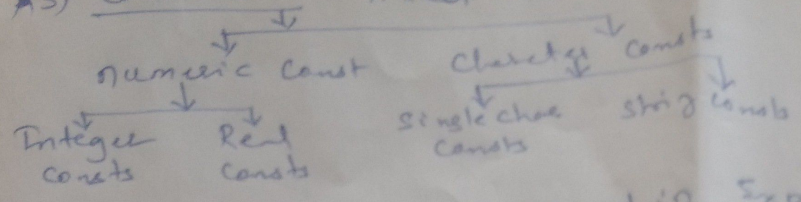
1) Identifiers & keywords

auto, break, case, char, continue, do, etc.

Rules for Identifiers

- 1) 1st char must be alpha or -
- 2) consist only letters, digits, -
- 3) only 31 characters -
- 4) cannot use keyword
- 5) must not contain white space.

*3) Constants :- fixed values that don't change during the execution.



* Real no's can be expressed in Exponential (or Scientific) notation.

Ex:- $215.65 \Rightarrow 2.1565e^2 = 2.1565 \times 10^2$
 $25,000 \Rightarrow 25e3$
 $0.12 \Rightarrow 12 \times 10^{-2} \quad 12e-2$

* Backslash Const's :- Special char's used in output functions.

Ex: 'n' new line '\f' form feed
 't' horizontal tab '\o' null
 '\a' audible alert (bell)
 '\b' backspace

* Evolution :- History of ANSIC

