Indian Institute of Information Technology
Sri City

Computer Programming

Computer Basics

Instructor(UG-1/Sec-3)
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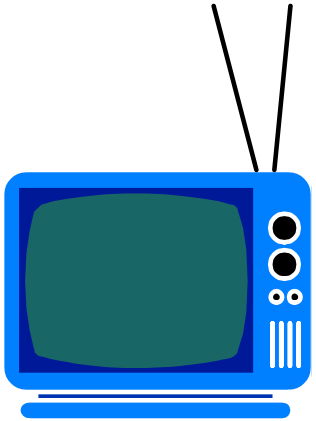
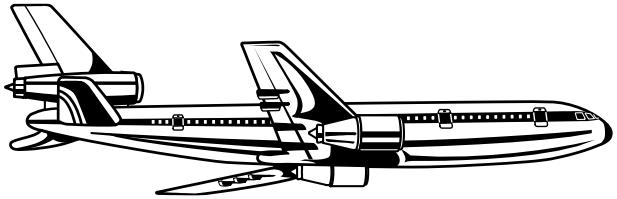
Core Course

- What is a computer?

WHICH ONE IS THE COMPUTER?





DEFINITION OF A COMPUTER

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General purpose

Programmable

Computing the information

With input and output

DEFINITION OF A COMPUTER

A computer is an electronic data processing device, which accepts and stores data input, processes the data input, and generates the output in a required format.

FUNCTIONALITIES OF A COMPUTER

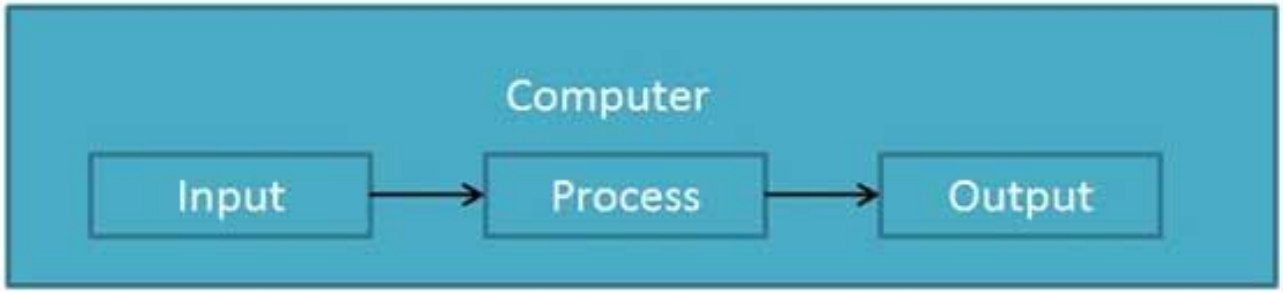
Step 1 − Takes data as input.

Step 2 − Stores the data/instructions in its memory and uses them as required.

Step 3 − Processes the data and converts it into useful information.

Step 4 − Generates the output.

Step 5 − Controls all the above four steps.



INTERNAL ORGANIZATION OF COMPUTERS

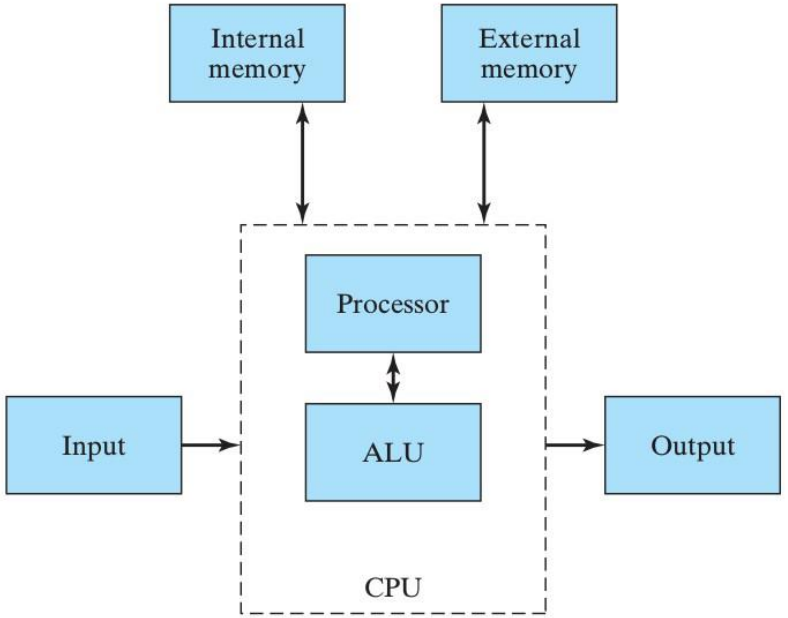
– Computer Hardware

- It refers Computer equipment or devices (thumb drive, a keyboard, a flat-screen monitor, or a printer)

– Computer software

- Programs that describe the steps we want the computer to perform

1. **CPU (Central Processing Unit)**
2. **Memory**
3. **I/O (Input / Output) devices**



COMPUTER TERMINOLOGY

- **Computer's speed** = number of cycles completed in one second.
  - **Cycles are measured in:**
  - Megahertz (MHz) = millions of cycles per second
  - Gigahertz (GHz) = billions of cycles per second central processing unit (CPU)

- **Bits, Bytes, and Binary Numbers**
  - Bit is the smallest unit of storage. A bit stores just a 0 or 1
  - One byte = collection of 8 bits.

$10^1 = 10$
$10^2 = 10*10 = 100$
$10^3 = 10*10*10 = 1,000$
$10^6 = 1,000,000$

Kilobyte (KB) = 1,000 bytes
Megabyte (MB) = 1,000 bytes, or 1 million (1,000,000) bytes
Gigabyte (GB) = 1,000 MB, or 1 billion (1,000,000,000) bytes
Terabyte (TB) = 1,000 GB, or 1 trillion (1,000,000,000,000) bytes

Computers count by base 2:

$2^1 = 2$
$2^2 = 2*2 = 4$
$2^3 = 2*2*2 = 8$
$2^{10} = 1,024$
$2^{20} = 1,048,576$

- What can computers do?

BUSINESS

- Payroll calculations
- Budgeting
- Sales analysis
- Financial forecasting
- Managing employee database
- Maintenance of stocks
- And many more ……

BANK

Banking –
almost totally dependent on computers.

Online accounting facility –
completely online

ATM machines –
completely automated

EDUCATION

- The computer helps in providing a lot of facilities in the education system.

HEALTHCARE

- **Diagnostic System** − Computers are used to collect data and identify the cause of illness.
- **Lab-diagnostic System** − All tests can be done and the reports are prepared by computer.
- **Patient Monitoring System** − These are used to check the patient's signs for abnormality such as in Cardiac Arrest, ECG, etc.
- **Pharma Information System** − Computer is used to check drug labels, expiry dates, harmful s effects, etc.
- **Surgery** − Nowadays, computers are also use performing surgery.

COMMUNICATION

- E-mail
- Chatting
- Usenet
- FTP
- Telnet
- Video-conferencing

GOVERNMENT

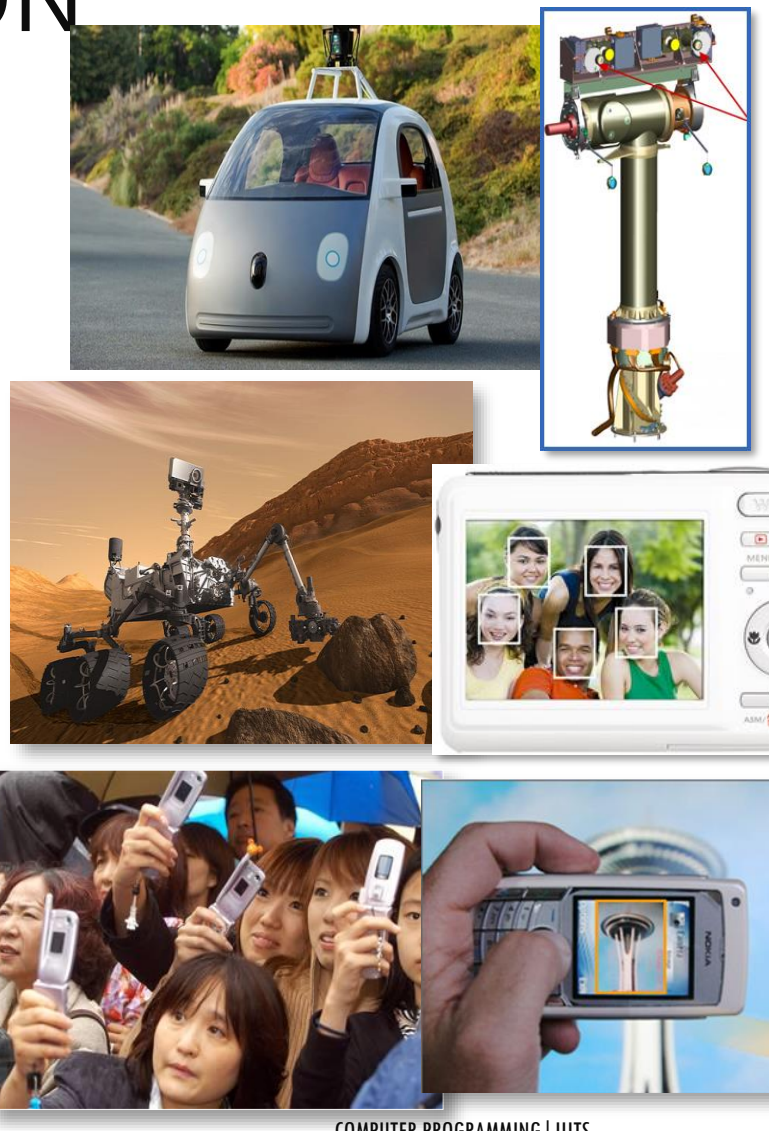
- Budgets
- Sales tax department
- Income tax department
- Computation of male/female ratio
- Computerization of voters lists
- Weather forecasting

MILITARY

- Missile Control
- Military Communication
- Military Operation and Planning
- Smart Weapons

COMPUTER VISION

- Image Recognition
- Object Detection
- Image Captioning
- Automatic Vehicles
- Smart Cars
- Biomedical Image Analysis
- Face Detection
- Face Recognition
- Biometrics
- Forensics
- Sports
- Vision based interactions
- Robotics
- Action Recognition
- Many more ……



WHAT MIGHT COMPUTERS DO– TOMORROW?

WHAT MIGHT COMPUTERS DO– TOMORROW?

- Diagnose diseases
- Control robots that walk, talk, and learn
- Compose music and create art
- Information forensics
- Artificial intelligence
- And many more .....

Syllabus (Tentative)

Course Contents:

- ✓ **Module 1: Basics**
  - ✓ History, Basic UNIX Commands, Introduction to Programming , Procedural Programming , Programming Languages, Introduction to compiler ,Linker, loader, Interpreter , Preprocessing Directives, Namespace Declaration, Overview of C.
- ✓ **Module 2: Scope of variables Constants**
  - ✓ Variables and Data types in C, Arrays, Character Arrays and Strings, Operators and Expressions, Operator Precedence, Managing Input and Output operation
- ✓ **Module 3:**
  - ✓ Decision making and Branching: Conditions-if-else constructs, switch case, Ternary conditional statements, Decision making and looping : for, while, do while, break, continue
- ✓ **Module 4: Functions**
  - ✓ **User defined function in C** , Recursions
- ✓ **Module 5:** Structures & Pointers Structures, Unions, Enums, Pointer Concepts
- ✓ **Module 6:** File Management in C

***** Add on Concepts (if time permits): Introduction to Dynamic Memory Allocation

Course Content Weightage(Tentative):

1. **Theory:** 40%:[Mid1 10%, Mid2 10%, Majors 20%]
2. **Lab Exams:** 20%: [Mid1 10%, Final 10%]
3. **Assignment:** 30%
4. **Quizzes:** 10% + Bonus (if feasible)

- **Text Books:**
  - The C Programming Language. 2015 Edition. Brian Kernighan and Dennis Ritchie.
  - C Programming, Herbert Schildt
- **Reference Books:**
  - C Programming Absolute Beginner's Guide, Greg Perry and Dean Miller
  - Learn C the Hard Way, Zed A. Shaw
  - Head First C, David Griffiths and Dawn Griffiths
  - C Programming: A Modern Approach, (2nd Edition)' by K. N. King
  - Let Us C. 15th Edition. Yashwant Kanetkar. BPB Publication

Questions ???

Thank You !!!