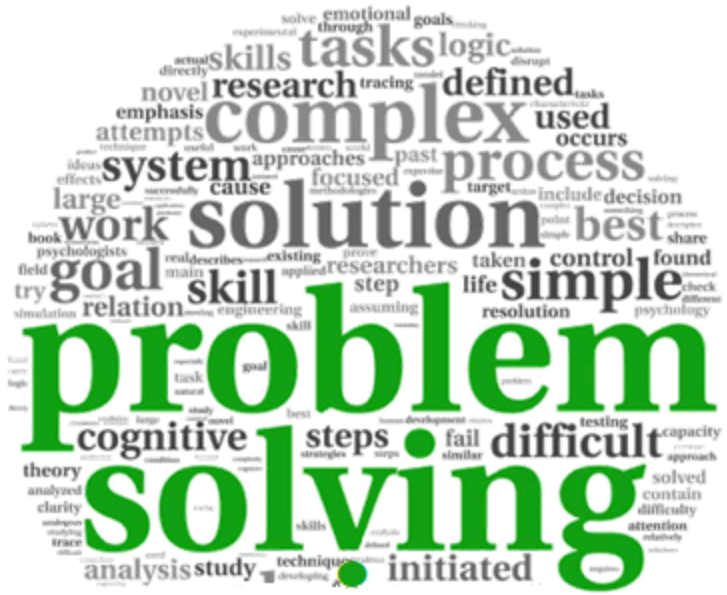
MANIPAL INSTITUTE OF TECHNOLOGY
MANIPAL
(A constituent unit of MAHE, Manipal)



CSE 1051

INTRODUCTION TO THE COURSE

Opening remarks

- Greetings
- Importance of the course
- Connection between the course and real-world applications

CSE-1051- PROBLEM SOLVING USING COMPUTERS (PSUC)

Major Course modules

- ✓ Introduction to Computing (5 Hr)
- ✓ C language – Types, operators, expressions and control flow (8 Hrs)
- ✓ Arrays & Strings (8 Hrs)
- ✓ Modular programming and Recursive functions (9 Hrs)
- ✓ Advanced data types in C (Structures and Pointers) (6 Hrs)

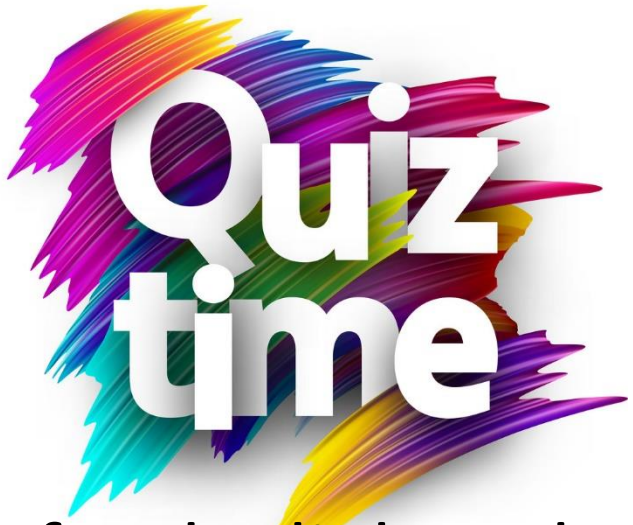
Course Facilitation

- Teaching Methodology
  - Power point presentation and Digital scribble pad
- Mode
  - Microsoft Teams
- Syllabus, Course Plan and Assessment scheme & schedule will be shared soon.

Best Practices

- Appeal to move to the higher cognitive levels
- Making reference/notes from prescribed text books/resources
- Preparing own class notes
- Discussion with peers and teacher
- Punctuality and Presence (Attendance) in the class


Happy
Learning



Go to posts/chat box for the link to the question **PQn. S1.0**

submit your solution in next 2 minutes

The session will resume in 3 minutes

Introduction to Computing

S1_1

Objectives

To learn and appreciate the following concepts

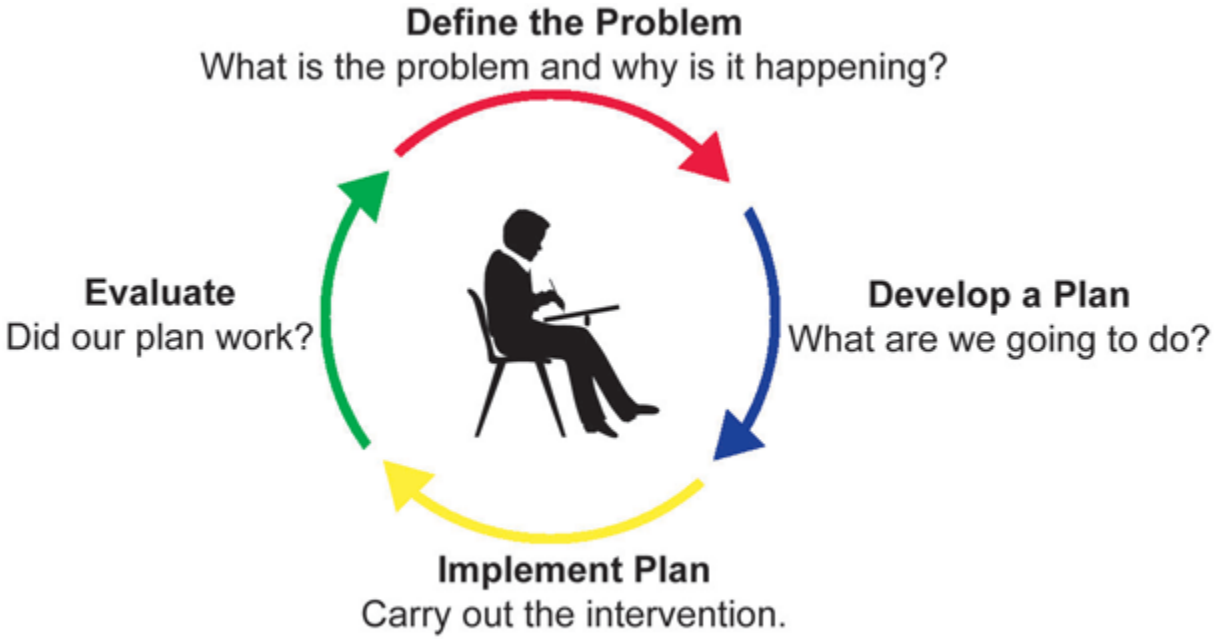
- ✓Problem solving basics
- ✓Logic and its importance in problem solving
- ✓Various computational problems and its classification
- ✓Computer Organization and operating system
- ✓Different types of languages
- ✓History of C, Typical C program development environment.

Session outcome

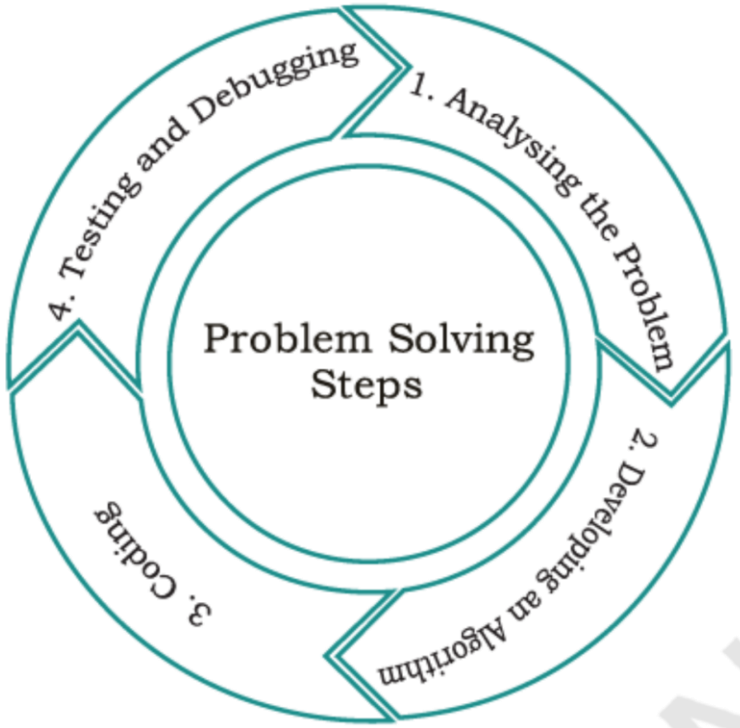
- At the end of session the student will be able to understand
  - Importance of problem solving techniques, Computer organization, Operating system, Types of languages
  - History of C, programming development environment

Introduction to **problem solving**

Problem Solving *is the sequential process of analyzing information related to a given situation and generating appropriate response options.*

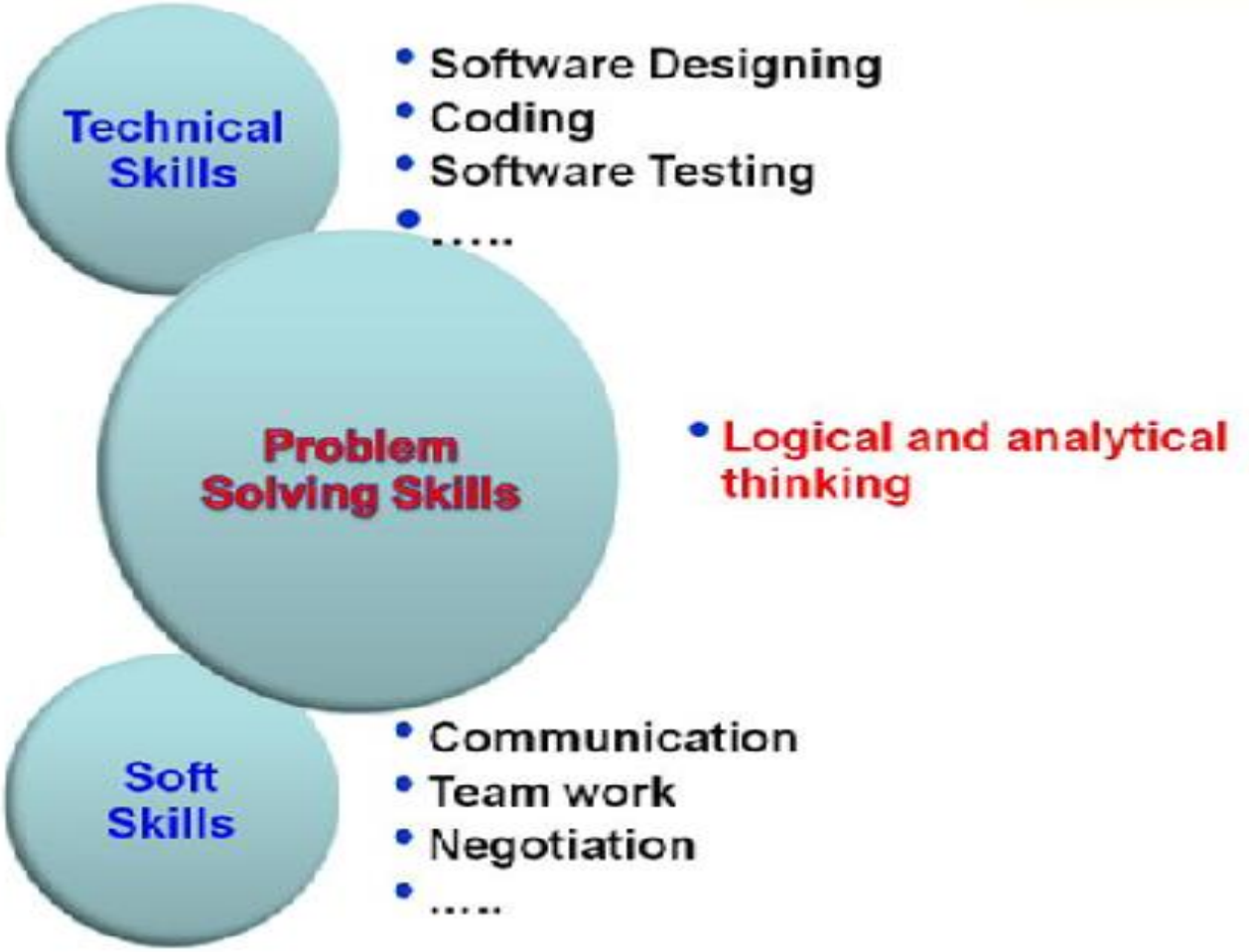


General problem solving steps



Problem solving steps for Computing

Skill set required for Software Engineers



What is a problem?

- A **problem** is a puzzle that requires **logical thought** or **mathematics** to solve
- A puzzle could be a set of questions on a scenario which consists of **description of reality** and a set of **constraints** about the scenario.
  - ✓e.g. **Scenario**- Infosys Mysore campus has a library. The librarian issues book only to Infosys employees.

Description of reality: There is a library in Infosys Mysore campus . There is a librarian in the library

Constraints: librarian issues book only to Infosys employees.

Questions about the scenario:

- How many books are there in the library?
- How many books can be issues to an employee?
- Does the librarian issue book to himself? Etc.

What is the fundamental requirement for answering these questions or in general solving any problem?

Logic

- A method of human thought that involves thinking in a linear, step by step manner about how a problem can be solved.
- **Logic** is a language for reasoning. It is a collection of rules we use when doing reasoning.

e.g. John's mother has four children.

First child is April

Second child is May

Third child is June

What is the name of fourth child?

Importance of **logic** in problem solving

- Solution for any problem(e.g. summation of two numbers) requires three things.

  Input: Input values(e.g. 3 and 2)

  Process: Process of summation

  Output: Output after process (e.g. sum of numbers, 5)

- The process part (e.g. summation) of the solution requires **logic** (How to sum) or in other words based on the logic, process is developed.

Importance of logic in problem solving

- For solving a problem, there may be multiple valid logics, some may be simple and some may be complex.

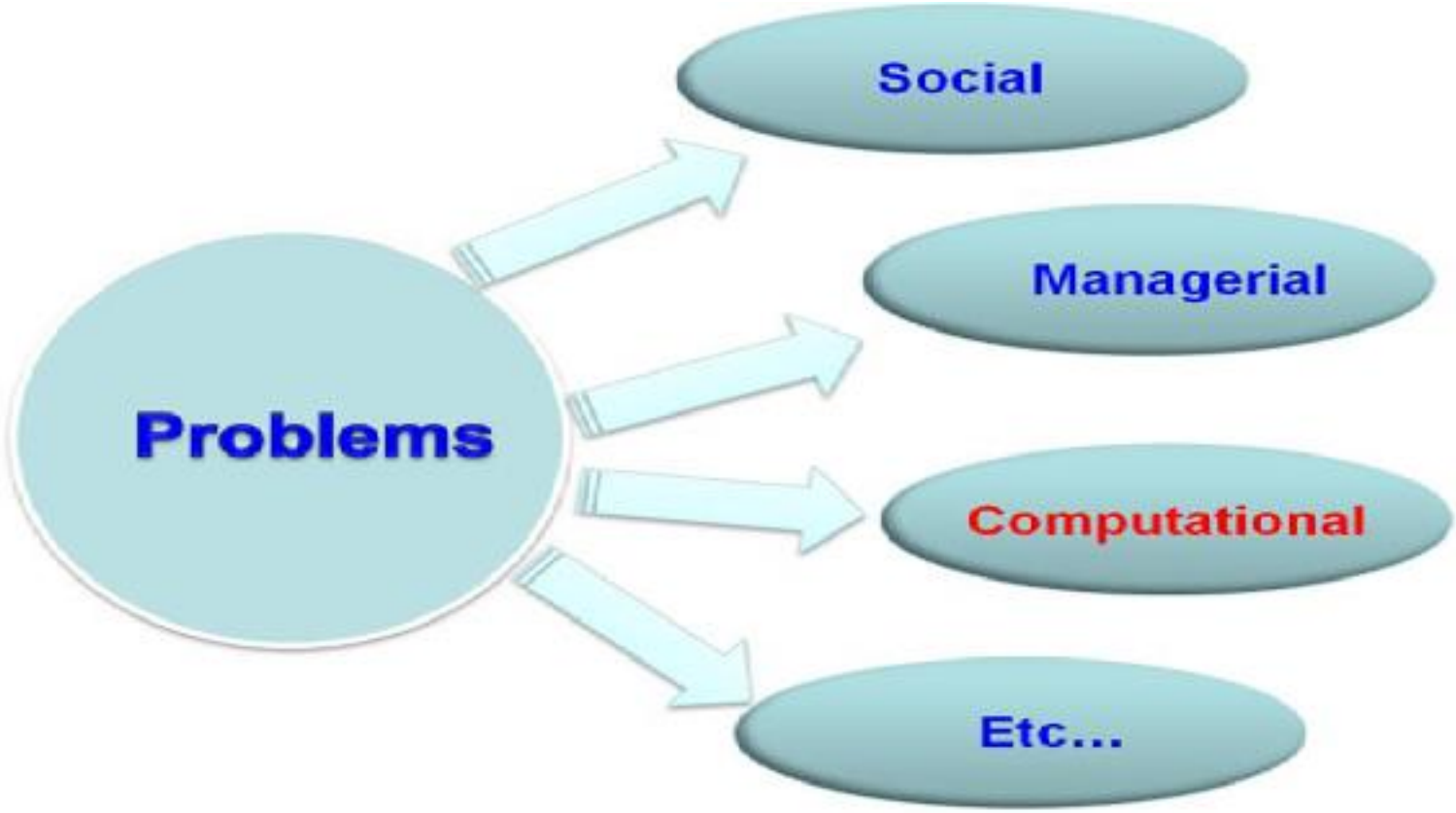
  e.g. To determine whether the number is prime or not.

Logic 1- divide the number by all the numbers starting from 2 to one less than the number and if for all the division operations, the reminder is non zero, the number is prime. Else the number is not prime.

Logic 2 – same as logic 1 but divide the number from 2 to number/2

Logic 3 - same as logic 1 but divide the number from 2 to square root of the number

Types of problems

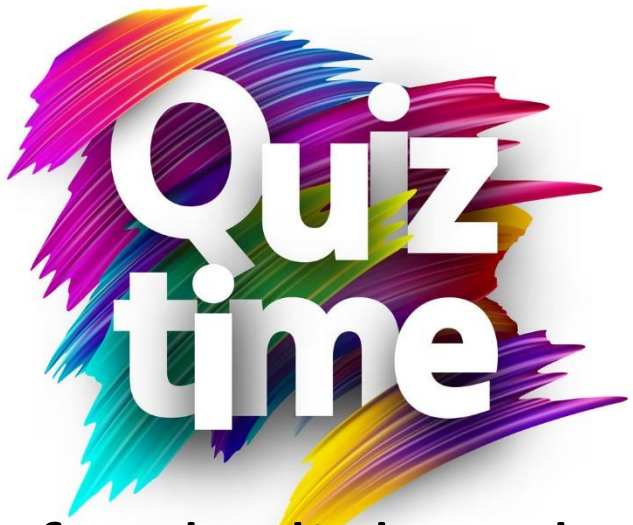


Computational Problems

Definition: Computation is a process of evolution from one state to another in accordance with some rules.

Broad **applications** of Computational Problem

Classification of computational problems



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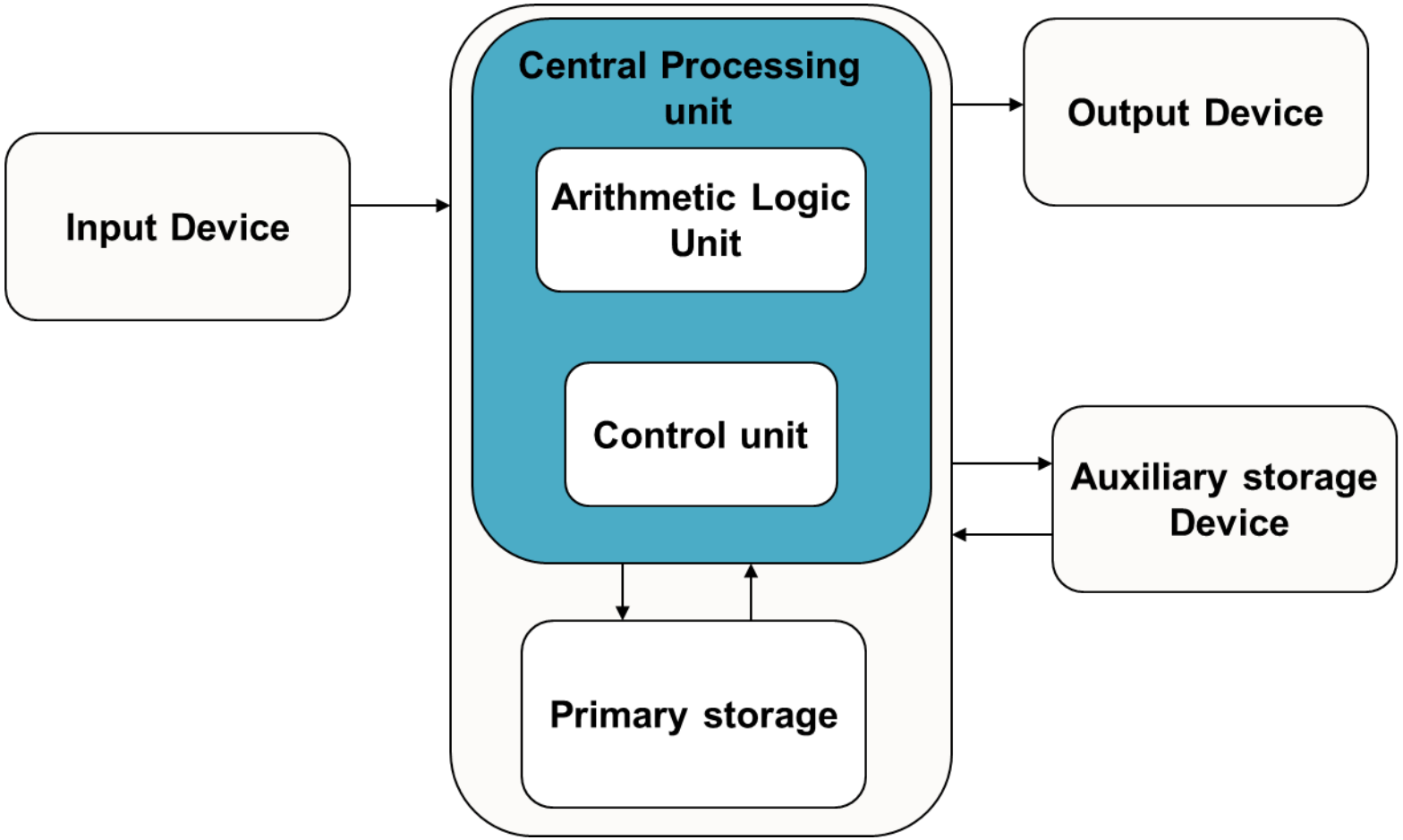
Computer Organization



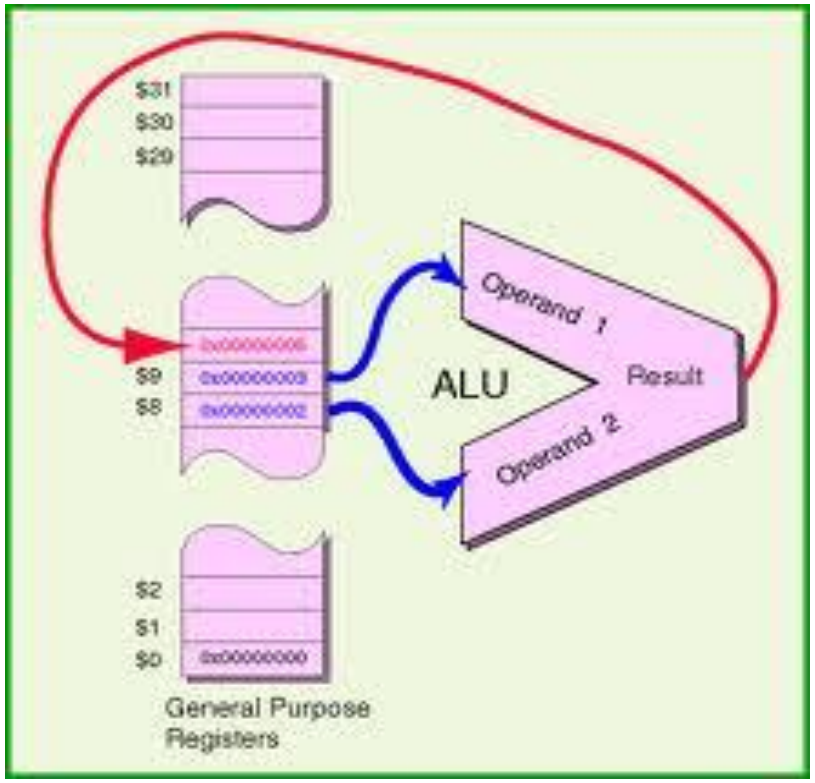
Central Processing Unit

- Data and instructions are processed in the CPU

- Consists of two functional units
  - Control Unit (CU)
  - Arithmetic and Logic Unit (ALU)

Arithmetic and Logical unit

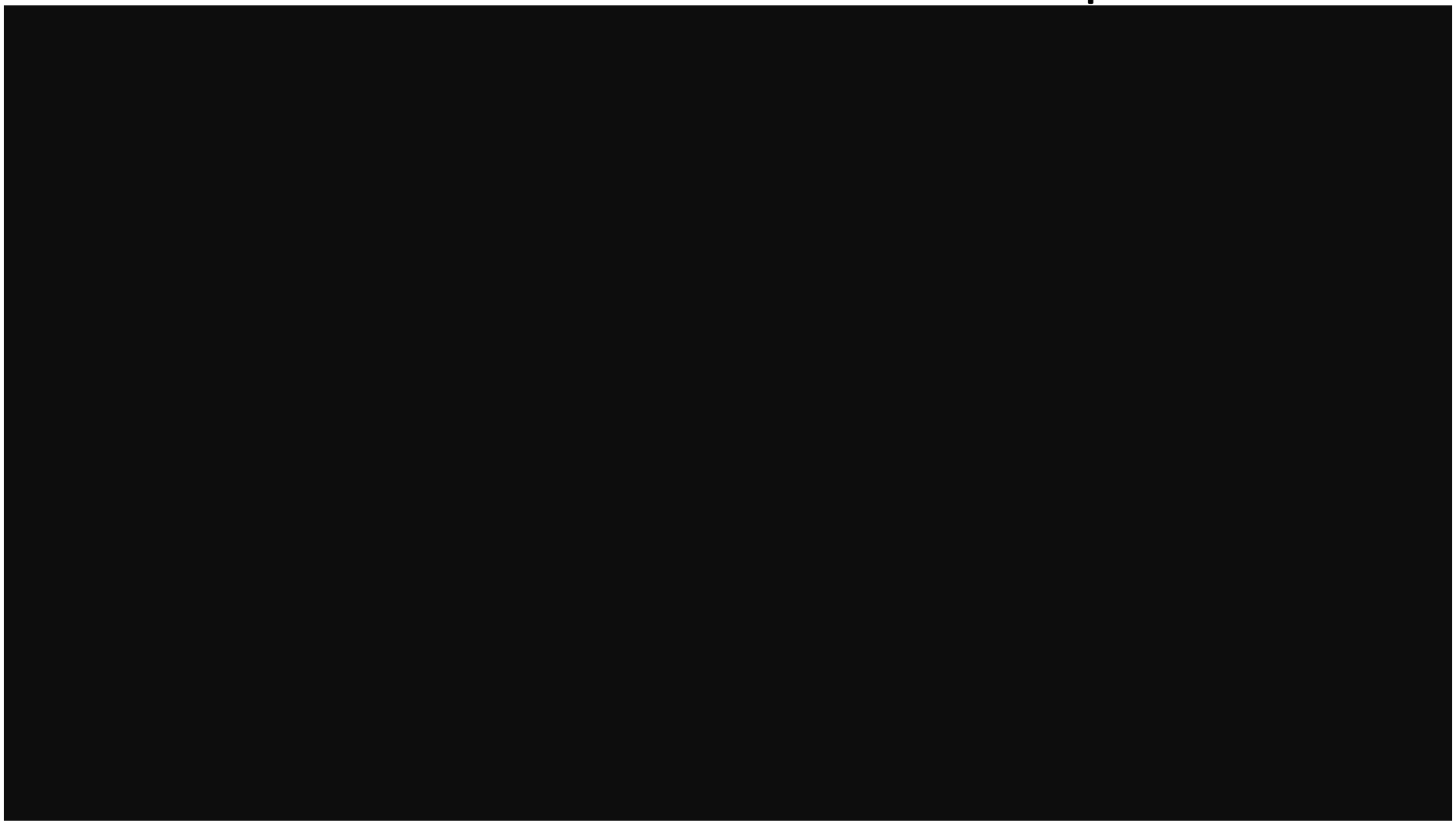
- Performs arithmetic and logical operations:
  - Example:
  - arithmetic(+,-,*,/ etc..) and
  - logical (AND, OR, NOT, <,= etc..) operations



Control unit

- Controls the order in which your program instructions are executed.
  - Functions of CU:
  - Fetches data and instructions to main memory
  - Interprets these instructions
  - Controls the transfer of data and instructions to and from main memory
  - Controls input and output devices.
  - Overall supervision of computer system

So what we learned about a computer….



Summary

- ✓Problem solving
- ✓Logic and its importance in problem solving
- ✓Computational problems and its classifications
- ✓Computer organization