



**M1: Concept of
Computer
Programming**

**Mr. J. Mishra
MGCUB, INDIA**

Objectives

Introduction

Problem Solving

Representation

Algorithm

Flowchart

**Computer
Programming**

Exercise

References

Introduction to Programming-II

Concept of Computer Programming

Course: B Tech in CSE

Course Name: Programming for Problem Solving

Course Code:

Semester: II

Session: 2019-20



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Outline

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Objectives

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Objectives

- Study on problem solving steps
- Study on problem representation as algorithm and flowchart



Introduction

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- Computer is not smart as humans to perform any task automatically, hence it requires to coding/programming. Based on coded programme, it could execute the solution of any problem with very high speed and high accuracy.
- Due to advantages of computer system, every real time problem seeks to be implemented in computer programming.
- Software are the set of instructions which are coded into computer memory followed by some standard language(set of keywords to form a syntax).
- Software coding demands proper planning and after which programmes or codes represented as a software.
- Some specific structured steps/processes should follow to solve a complex problem.

Example

Real time problem example

- Calculate interest for a term deposit in a particular bank.
- Calculate the $^{\circ}C$ temperature from $^{\circ}F$ temperature of a COVID-19 affected patient.
- Design a robotic arm of a robot to move over the ground.



Problem Solving

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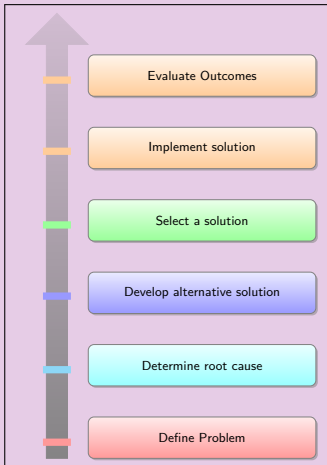


Figure 1: General used steps to solve a problem.



Representation

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Problem Solving in Computer

- Algorithmic Representation
- Flowchart Representation
- Computer Programming

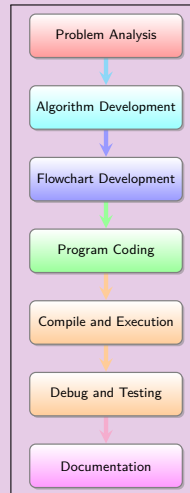


Figure 2: Computer Programming solution steps



Representation

Algorithmic Representation[1],[2]

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Algorithm

- It is step by step structured description to solve a problem
- Its a set of finite steps to define from start to end of any problem.

Algorithm (Sum of two numbers)

Input: x and y are two numbers

Output: Find sum z of two numbers x and y

- 1 Start
- 2 Take value of two numbers x and y
- 3 $z = x + y$
- 4 Show sum z
- 5 End



Representation

Flowchart Representation

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Flowchart

- It is a graphical representation of any algorithm.
- Its a workflow of any real time problem.

Flowchart (Sum of two numbers)

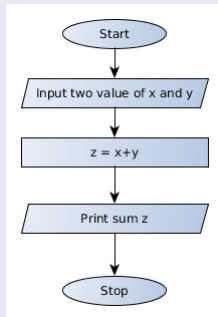


Figure 3: Flowchart of addition of two numbers.

Flowchart Symbols

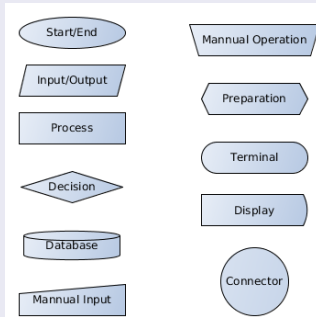


Figure 4: Different symbols in flowchart.



Computer Programming

Example 1

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Write an algorithm and flowchart to determine a given number is even or odd.

Algorithm

Input: Input a number x
Output: Display even or odd

```
1 Start
2 Take input x
3 if x%2 == 0 then
4     |   Print Even
5 else
6     |   Print Odd
7 end
8 End
```

Flowchart

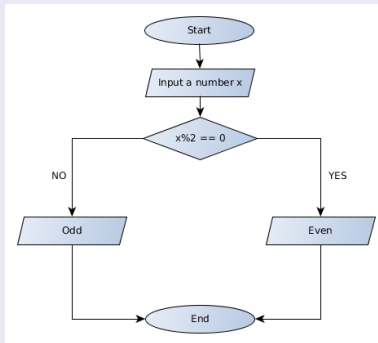


Figure 5: Different symbols in flowchart.



Computer Programming (Contd...)

Example 2

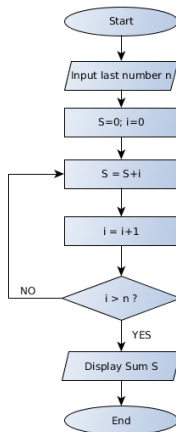
Write an algorithm and flowchart to develop the following formula: $S = 1 + 2 + 3 + 4 + \dots$

Algorithm

Input: Input last number n
Output: Display sum

- 1 Start
- 2 Take last number n
- 3 Initialize: $S=0$ and $i=0$
- 4 $S = S+1$
- 5 $i = i+1$
- 6 **if** $i > n$ **then**
- 7 Display Sum S
- 8 **else**
- 9 Go to Step 4
- 10 **end**
- 11 **End**

Flowchart





Exercise

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- Write an algorithm and flowchart to determine the largest number among three numbers.
- Write an algorithm and flowchart to determine a given number is positive or negative.
- Write an algorithm and flowchart to determine prime number.
- Write an algorithm and flowchart to develop the following formula : $S = 1 + 3 + 5 + \dots$



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Thank You...