CS & IT ENGINEERING

C-Programming

C Programming Fundamentals

Lecture No.- 02

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Recap of Previous Lecture

Topic Computer Fundamental

- Computer Parts
  - i/o Devices, CPU, Memory, Peripherals
- CPU Parts → CU, ALU, RU
- Registers → AC, PC, IR, MAR, MDR, SP, XR, TR, BR...
- Memory Capacity ⇒ bits, Bytes
- Types of Memory → Registers, Cache, Primary, Secondary

Topics to be Covered

Topic Program Development steps

#Q. 32 GB = ____ K bits

a) 2^{25}

b) 2^{28}

c) 2^{22}

d) 2^{33}

32 GB

$= 2^5 * 2^{30}$ Bytes

$= 2^5 * 2^{30} * 2^3$ bits

$= 2^{38}$ bits

$= 2^{28} * 2^{10}$ bits

$= \underline{2^{28} \text{ K bits}}$

#Q. which Register holds address of data for current Instruction?

a) PC

b) AC

c) MAR

d) IR

Program Development Steps

Program: Set of Instructions

Instruction: Any Executable Statement, written using any Computer Language

In the Program Development, There are 4 Major Phases (or) Steps:

{ 1. Understand Problem
  2. Analyze Problem }

✓ 1. Algorithm

2. Flow chart

✓ 3. Pseudo Code

4. Program

Algorithm : A Simple step-by-step Procedure written in Simple language.

Ex: 1 Write an algorithm to check given number is Even or odd.

Step 1 : Start / Begin

Step 2 : Accept number as input

Step 3 : Divide the number with 2 and check Remainder

Step 4 : If Remainder is Zero, Then Print it as Even, Otherwise Odd.

Step 5 : Stop / End

Properties of an Algorithm

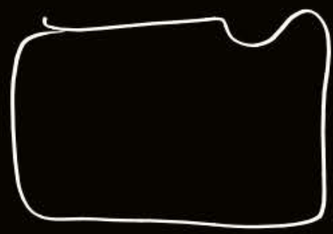
1) Generality
2) Simplicity
3) Input / Output
4) Finiteness / Completeness
5) Accuracy / Correctness

Flowchart : The graphical (or) Pictorical representation of an algorithm.

Different Shape/symbol	Purpose
Oval	Start/stop
Parallelogram	Input/output
Square (or) Rectangle	Normal stmts
Rhombus	Condition Checking (or) Decision Making.
Arrows	Flow

Comment

Connector



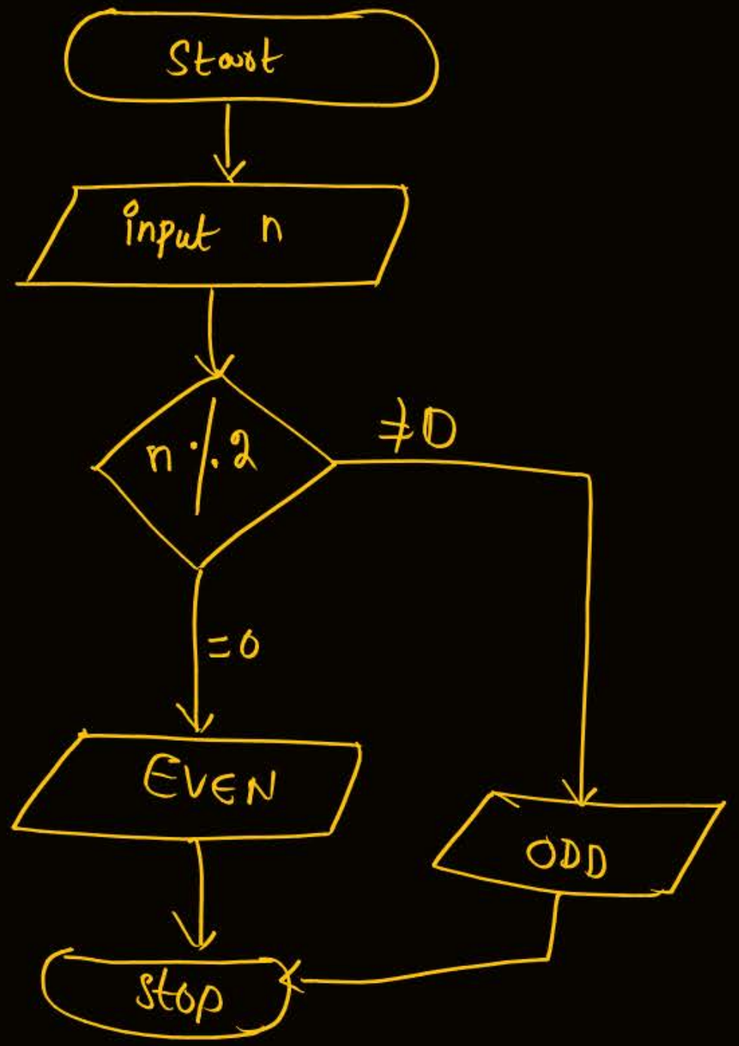
Document

Example

Algorithm

1. Start
2. Take input n
3. Divide with 2 and Check Remainder
4. if Remainder is zero Print Even
   Otherwise, Print Odd
5. Stop

Flow chart



Example-2

Problem: Take 2 numbers input and Calculate Sum, difference, Product of them

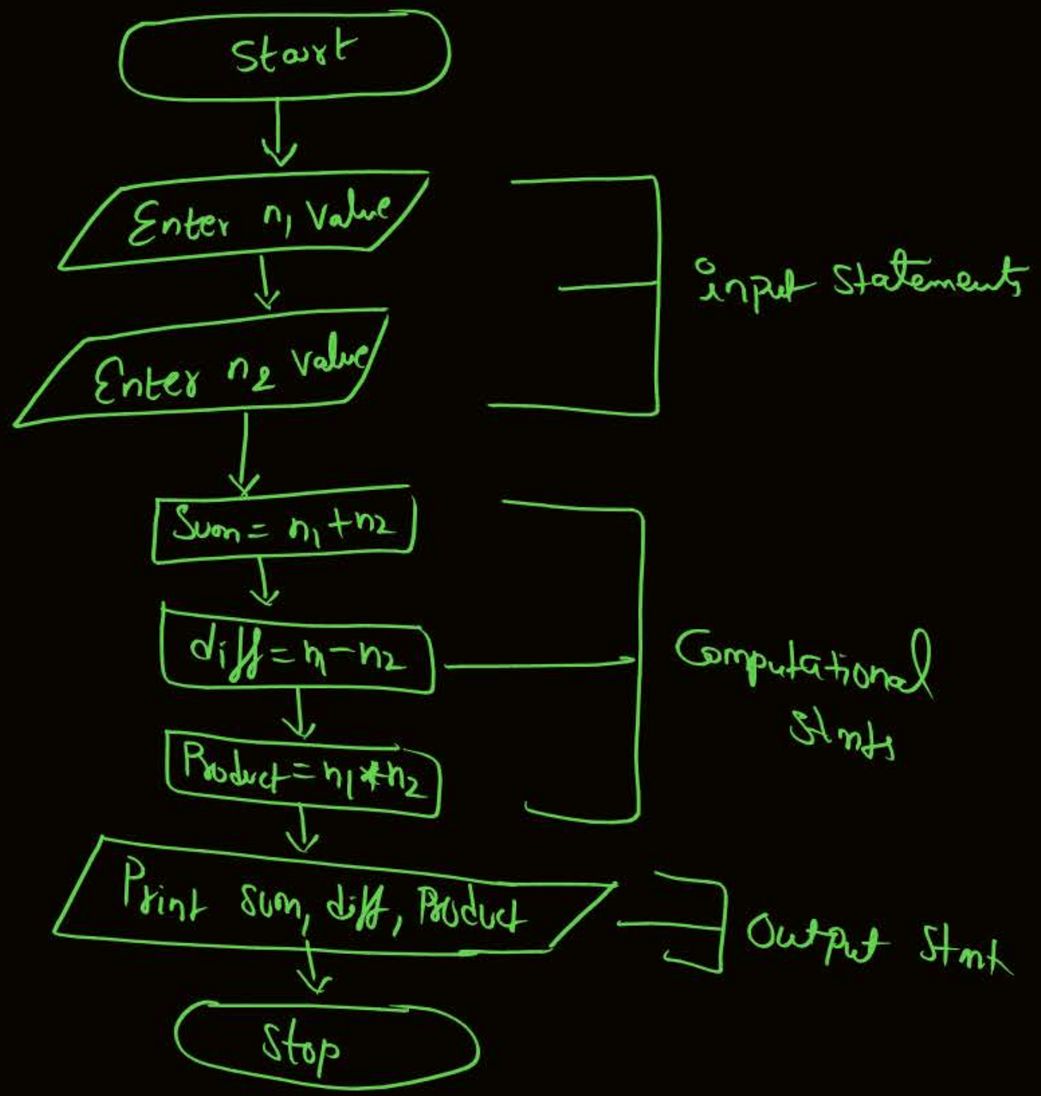
Algorithm

1. Start
2. Take first number as $n1$
3. Take second number as $n2$
4. Compute : Sum as $n_1 + n_2$

   difference as $n_1 - n_2$

   Product as $n_1 * n_2$
5. Print results
6. Stop

flow chart



Pseudo Code : Syntax free, Language independant, Raw version of Code.

'C' Program

```
main()
{
  int n;
  scanf("%d",&n);
  if(n%2==0)
  {
    Printf("EVEN");
  }
  else{
    Printf("ODD");
  }
}
```

Algorithm

Start

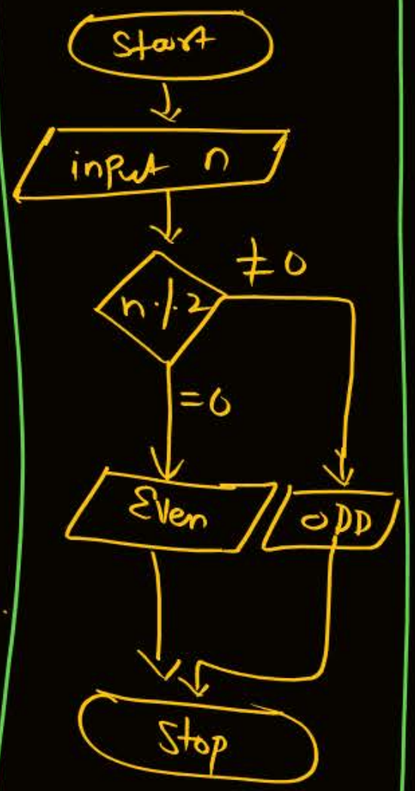
Input n Value

Divide with 2 check Remainder

if Remainder is zero, Then
Print it as Even,
Otherwise Print it as odd.

Stop.

Flowchart



Pseudo Code

Procedure Even_or_Odd:
Begin:
- Scan n Value
- Compute n%2
- if n%2 is 0, Print Even
  else print odd

End:

2 mins Summary

- Topic One
- Topic Two
- Topic Three
- Topic Four
- Topic Five

H/w

Write algorithm, Flow chart, Draw, Write Pseudo Code

1. Finding Entered year number is Leap year or not
2. Check number is Prime or not

THANK - YOU