PROGRAMMING

FOR PROBLEM SOLVING

{ C LANGUAGE }

Module :- 3

Start

Module 3 :- Conditional Branching And Loops

- Writing and evaluation of conditionals and consequent branching
- Iteration and loops

-: Conditional branching :-

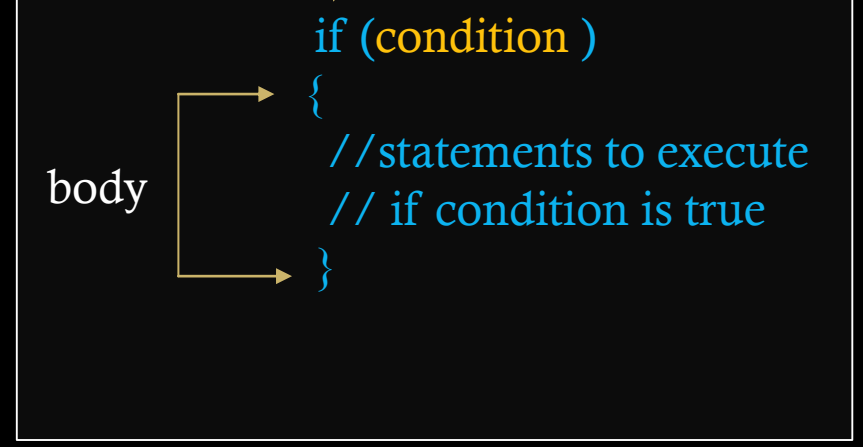
- Programming are used to make decisions based on the conditions , conditional statements execute sequentially when there is no condition around the statements statement

1. if statement
2. if else statement
3. nested if else statement
4. if else if ladder
5. switch statement

if statement

- It is the most simple decision making statements it is used to decide whether a certain statement or block of statement will be executed or not i.e if a certain condition is true then a block of statement is executed otherwise not
- If the condition is true its body execute otherwise does not execute
- In the case of if in the place of condition always zero and non zero value is checked in which zero means condition false and non zero means condition true

Syntax :-



Example of if statement

1. Greater value in 2 number
2. Greater value in 3 number
3. Check given number is positive or negative or zero
4. Show result according to percent

if else statement

- The if statement alone tells us that if condition is true it will execute a block of state and if the condition is false it won't but what if we want to do something else if the condition is false here comes the c else statement
- If the condition is true if part executes and if the condition is false else part executes
- In the case of if in place of condition always zero and non – zero value is checked in which zero means condition false and non – zero means condition true

Syntax :-

```
if (condition )
{
 //statements to execute
//if condition is true
}
else
{
 //statements to execute
// if condition is false
}
```

Example of if else statement

1. Check given number is Even or odd
2. Voting program
3. Check character is vowel or consonant
4. Loging program
5. Check alphabet is uppercase or lowercase
6. Input three angle of triangle and check triangle is valid or not
7. Calculate profit and loss

Nested if statement

- It means an if statement inside another if statement inside another if statement i.e we can place an if statement inside another if statement
- Nested means one inside another so one if inside another if is called nested if
- In the case of if in the place of condition always zero and non zero value is checked in which zero means condition false and non zero means condition true

Syntax :-

```
if (condition 1 )
 {
    if (condition  2)
     {
      //statements 1
     }
    else
     {
      //statements 2
     }
 }
 else
 {
     if (condition  3)
    {
      //statements 3
     }
    else
     {
      //statements 4
     }
  }
  ……up to n
```

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Example of nested if statement

if-else ladder

- If else if statement is also known as if else if ladder it is used when there are more then two possible action based on different conditions
- It is a part of conditional statement that executes only one condition at a time
- if all conditions are false then else part executes
- It is executes that condition that becomes first true from the top
- In the case of if in the place of condition always zero and non zero value is checked in which zero means condition false and non zero means condition true

syntax :-

```
if (condition  1)
  {
     //statements 1
  }
 else if (condition  2)
  {
     //statements 2
  }
    .....
 else if (condition  n)
  {
     //statements n
  }
else
  {
    //statement
  }
```

Example of if else ladder

1. Show result according to percent
2. Greater value in 3 number
3. Check given character is alphabet or digit or special symbol

Switch statement :-

- A switch case statement is a multi branched statement which compares the value of a variable to the values specified in the case the switch statement allows us to execute one code block among alternative you can do the same thing with the if… else if ladder
- It is a part of conditional statement that executes only one condition at a time
- If all conditions are false then default part executes
- It executes that condition that becomes first true from the top

Syntax :-

```
switch (expression)
 {
   case constant 1: statement 1
        break ;
   case constant 2: statement 2
        break ;
     ……..
   case constant n: statement n
        break ;

    default : default statement
 }
```

Example of switch statement

1. Input any number and print day of week
2. Input any number and print month name and number of days
3. Check alphabet is constant or vowel method 1
4. Check alphabet is constant or vowel method 2
5. Simple calculator
6. Simple ATM

Iteration And Loops

- Iteration is a process where a set of instructions or statements is executes repeatedly for a specific number of time or until a condition met
- Iteration statements are most commonly known as loop

- There are three types of looping statement

1. for loop
2. while loop
3. do – while loop

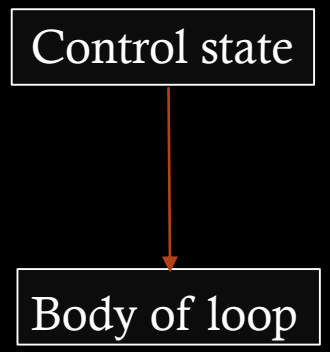
- **Loop consist three part :-** initialization , condition , increment/decrement or updation
- A loop consist two part one is body of loop and second is control statement body of loop executed until special condition becomes false.

- Classification of loop depending upon position of control statement in a program a loop is classified into two types

1. Entry controlled loop
2. Exit controlled loop

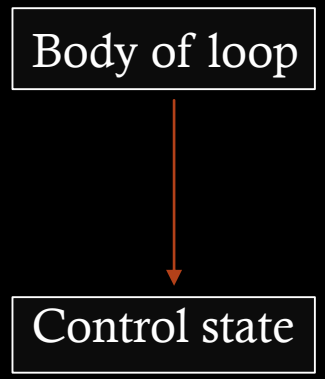
- In entry controlled loop condition checked before the execution of body of loop

eg. While , for



- In exit controlled loop condition is checked after the execution of body of loop

eg. Do-while



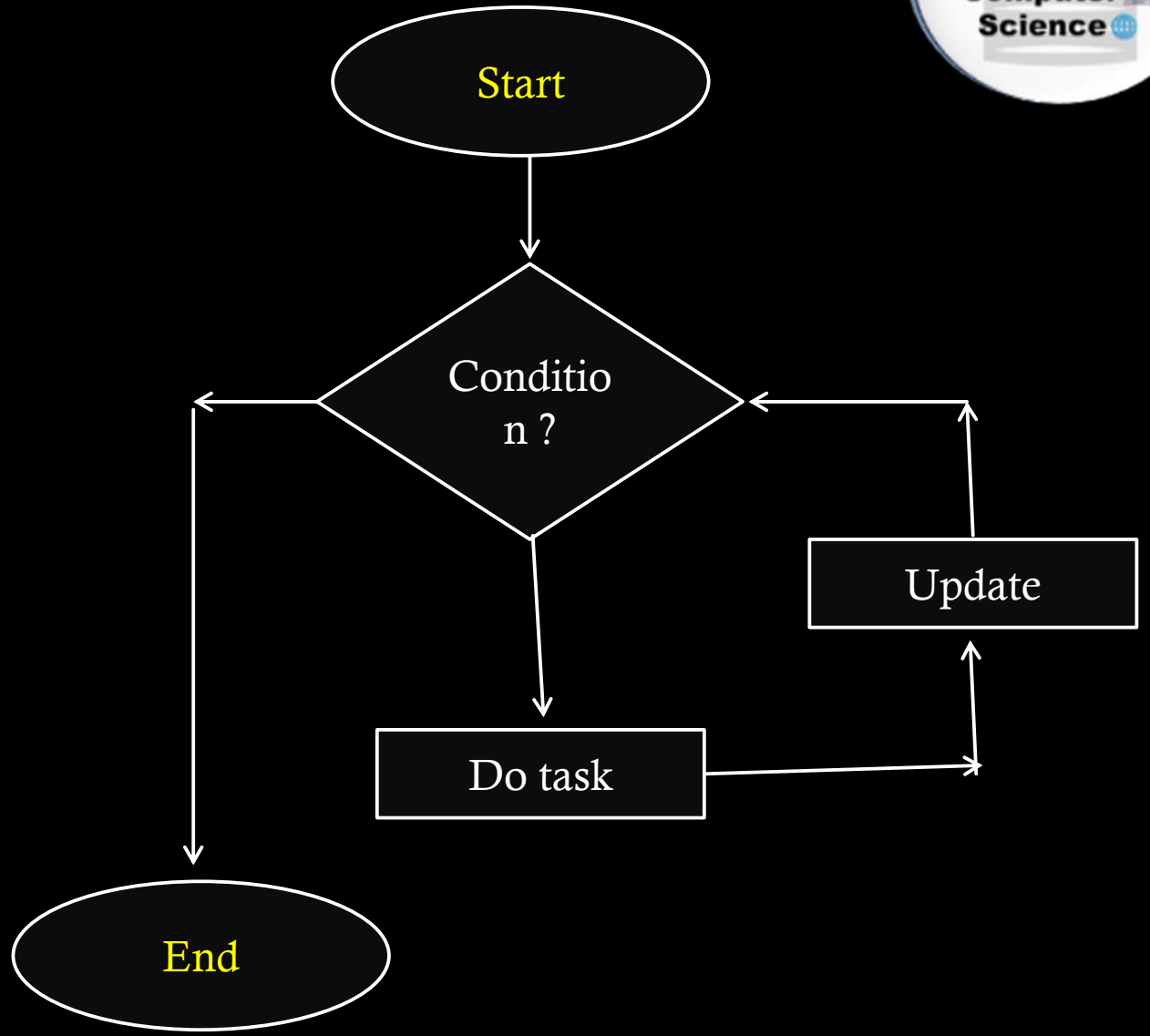
For loop :-

- **For loop :-** for loop is entry controlled loop it has three expression two semicolons are used to seprating these expression
- To run the body continuously until a required condition is full fill is called looping . It is used to perform looping operation . when the condition will become false the execution of loop will be stopped
- In for loop there are the three part initialization ,condition and increment/decrement.
- Initialization part executes only once.
- All the three part of for loop are optional

Flow Chart :-

Syntax:-

```
for( initialization ; condition ; updation )
  {
    statement 1;
        ……;
        ……;
     statement n;
  }
```



For loop example

1. Table of one
2. Table of any number
3. Print natural number from 1 to n
4. Print natural number from 1 to n reverse order
5. Print sum of natural number from 1 to n
6. Print A B C D ….Z method 1 (using character)
7. Print A B C D ….Z method 2 (using ASCII)
8. Print a b c d …..z method 1
9. Print a b c d …..z method 2
10. Print all even no. between 1 and 20 method 1
11. Print all even no. between 1 and 20 method 2

a) Print all odd no. between 1 and 20 method 1
b) Print all odd no. between 1 and 20 method 2
c) Print ASCII value of alphabet from A to Z
d) Factorial of any number
e) Factor of any number
f) Any base any power
g) LCM of two number
h) HCF of two number
i) Check given number is prime or not
j) Prime number between 1 to n
k) Print FABONACCI series up to n terms

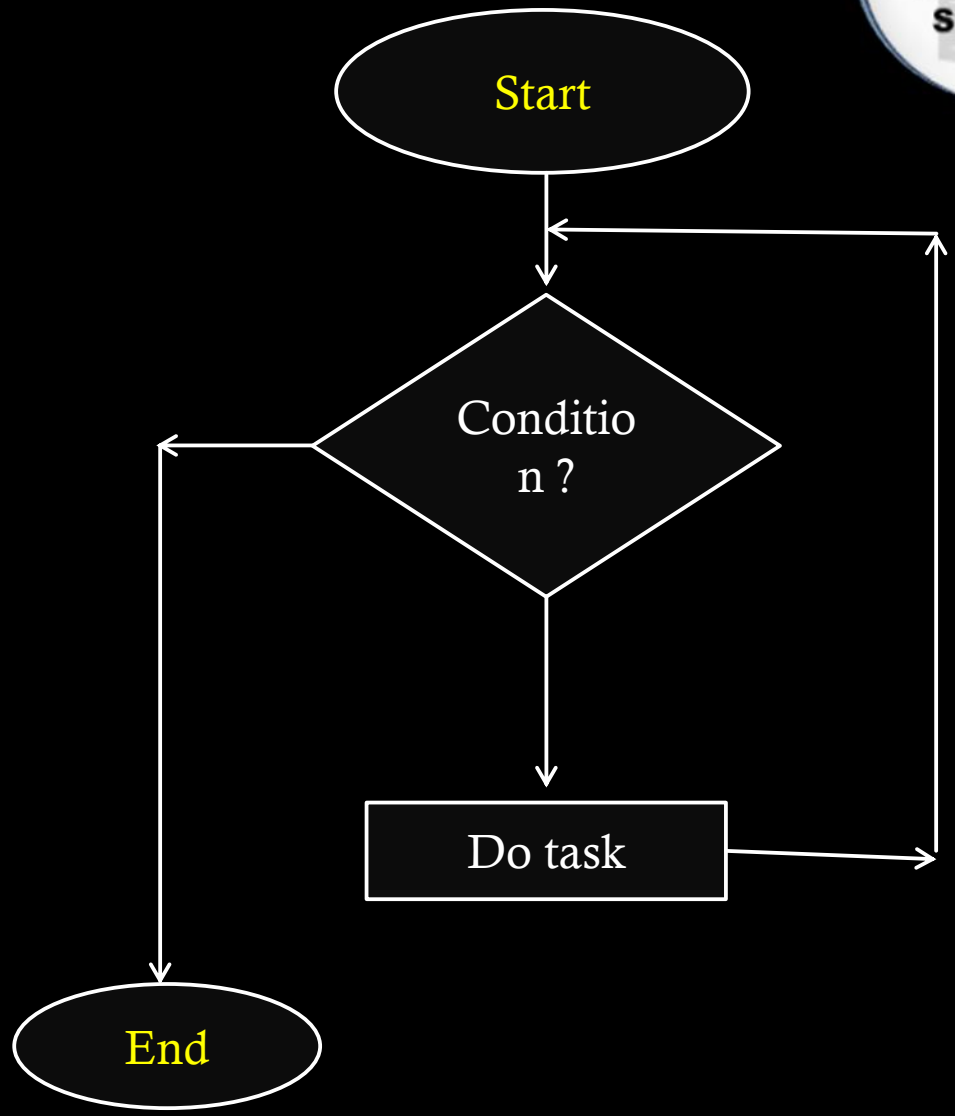
While loop:-

- It is a entry controlled loop. In while loop condition is evaluated before the execution of body of loop
- To run the body continuously until a required condition is full fill is called looping . It is used to perform looping operation . when the condition will become false the execution of loop will be stopped
- Its body will execute until the given condition is true.

Flow Chart :-

Syntax:-

```
initialization;
 while(condition)
   {
      statement 1;
            ……;
            ……;
       statement n;
    updation;
    }
```



while loop example

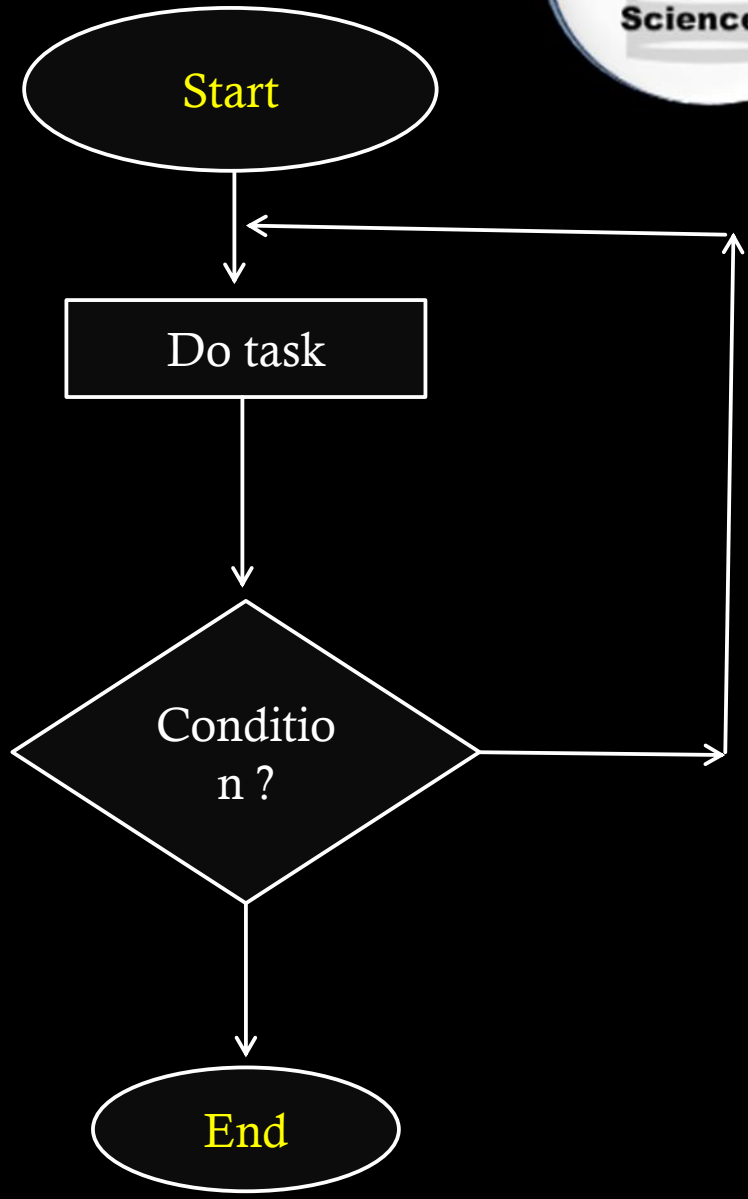
1. Table of one
2. Print digit of integer value in reverse order
3. Check number is palindrome or not
4. Find sum of digits of integer value
5. Find multiplication of digit of integer value
6. Print first and last digit of integer value

Do-while loop:-

- A do while loop is similar to while loop except the condition it always executed after the body of loop
- To run the body continuously until a required condition is full fill is called looping.it is used to perform looping operation. when the condition will become false the execution of loop will be stopped
- Its body will execute until the given condition is true.

Flow Chart :-

```
Syntax:-
        do
          {
            statement 1;
              ……;
              ……;
            statement n;
         }while(condition);
```



Do - while loop example

1. Table of one
2. Print digit of integer value in reverse order
3. Check number is palindrome or not
4. Find sum of digits of integer value
5. Find multiplication of digit of integer value
6. Print first and last digit of integer value

Nesting of loops:-

- When a loop is written inside the body of another loop then it is known as nesting of loop. Any type of loop can be nested inside any other type of loop
- A loop inside another loop is called nested loop so one for loop inside another for loop is called nested for loop and so on.

Syntax:-

```
for(initialization ; condition ; updation)
  {
     while (     )
      {
        statement 1;
         ……;
         ……;
        statement n;
      }
    statements;
  }
```

Nested loop example

1. Print table from 1 to 20
2. Print table from 1 to n

Break statement:-

- Break statement is used inside loops and switch statement when break statement encounter the body of loop and switch has been terminated and control transfer the outside of body
- The break statement is almost used with if-else inside the loop

Syntax:-

```
break;
```

continue statement:-

- The continue statement is used when we want to go to next iteration of loop after shipping some statement of the loop

Syntax:-

```
continue ;
```

Goto statement:-

- This is an unconditional control statement that transfers the flow of control to another part of the program

Syntax:-

```
goto label;
……;
……;
label;
        statement;
          ……;
          ……;
```

Thank You !!

Dhanybad !!

Shukriya !!