Control statements:-The flow of execution of statements in a program is called as control. Control statement is a statement which controls flow of execution of the program. Control statements are classified into following categories.
1. Sequential control statements
2. Conditional control statements

3. Unconditional control statements
   1. Sequential   control   statements:

statements   ensures   that   the instructions (or
statements) are executed in the same order in which they appear in the program. i.e. By default system executes the statements in the program in sequential order.
2. Conditional control statements
:Statements that are executed when a
condition is true. These statements are
divided into three categories. they are

Decision making statements

Switch case control statement or

Loop control statements or repetations

1. Decision making statements:- These statements are used to control the flow of execution of a program by making a decision depending on a condition, hence they are named as decision making statements. Decision making statements are of four types

1. Simple if
2. if else
3. nested if else
4. If else ladder

1. Simple if statement: if the test expression is true then if statement executes statements that immediately follow if

Syntax:

If(test expression)

{

List of statements;

}

/*largest of two numbers*/
#include<stdio.h>
int main()
{
int a,b;
cout<<"Enter any two integers:";
cin>>a>>b;
if(a>b)
        cout<<"A is larger than B\n A="<<a;
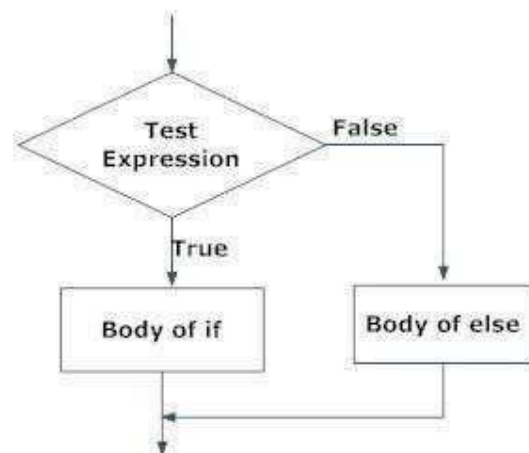if(b>a)
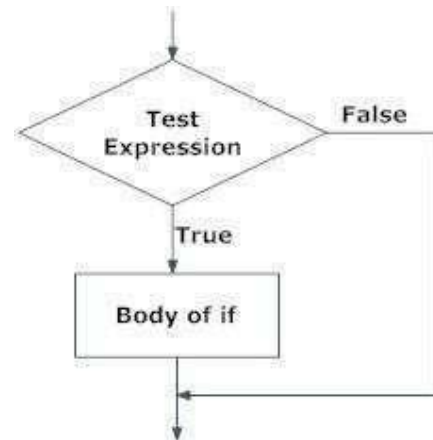   cout<<"B is larger than A\n A="<<b;
return 0;
}

2. if –else statement:
        If test expression is true block of statements following if are executed and if test expression is false then statements in else block are executed
if (test expression)
{
        statement block1;
}
else
{
        statement block2;
}

/*largest of two numbers*/

#include<iostream.h>
int main()
{
int a,b;
cout<<"Enter any two integers:";
cin>>a>>b;

if(a>b) cout<<"A is larger than B\n A="<<a;

else   cout<<"B is larger than A\n A="<<b;

return 0;

}

3. Nesting of if-else **statements** It's also possible to nest one if statement inside another. When a series of decisions are to be made.

If –else statement placed inside another if else statement

Syntax:

```
If(test expression)
{If(test expression) {
        //statements
        }
        else
        { //statements
        }
}
else
{If(test expression) {
        //statements
        }
        else
        { //statements
        }
}
```
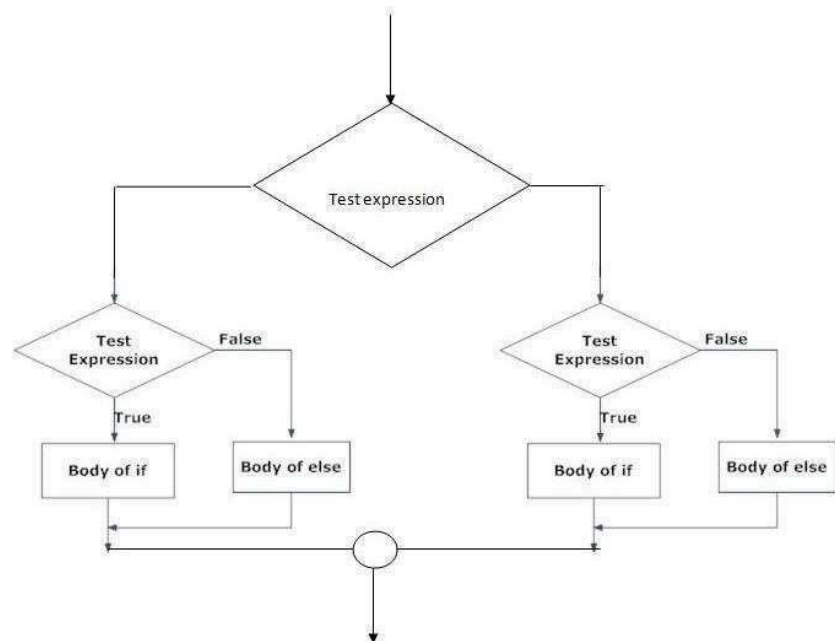
```
/*largest of three numbers*/
#include<iostream.h>
#include<conio.h>
int main()
{
int a,b,c;
cout<<"Enter a,b,c values:";
cin>>a>>b>>c;
        if(a>b)
        {
                if(a>c)
                {
                        cout<<"A ia largest among three numbers\n";
                        cout"A= "<<a;
                }
                else
                {
                        cout<<"C ia largest among three numbers\n";
                        cout<<"c= "<<c;
                }
        }
        else
        {if(b>c)
                {
                        cout<<"B ia largest among three numbers\n";
                        cout<<"B="<<b;
```

```
                }
                else
                {
                        cout<<"C ia largest among three numbers\n";
                        cout<<"c="<<c;
                }
        }
getch();

return 0;
}
```

4. if else ladder

```
    if(condition1)
            statement1;
    else if(condition2)
            statement 2;
    else if(condition3)
            statement n;
    else
            default statement.
    statement-x;
```

The nesting of if-else depends upon the conditions with which we have to deal.

The condition is evaluated from top to bottom.if a condition is true the statement associated with it is executed. When all the conditions become false then final else part containing default statements will be executed.

```
#include<iostream.h>
void main()
{
int per;
cout<<"Enter
percentage"; cin>>per;
if(per>=80)
        cout<<"Secured
Distinction"<<endl; else if(per>=60)
        cout<<"Secured First
Division"<<endl; else
if(per>=50)
        cout<<"Secured
Second Division"<<endl;
else if(per>=40)
        cout<<"Secured          Third
Division"<<endl;
else
cout<<"Fail"<<endl

}
```
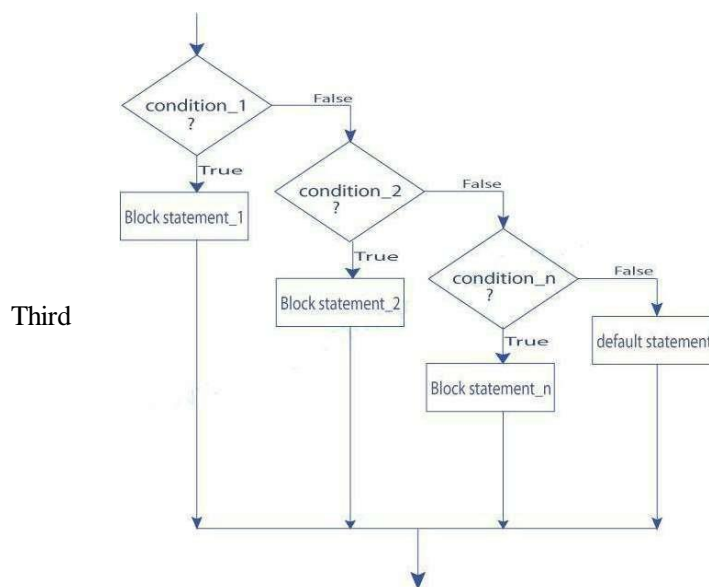

THE SWITCH STATEMENT or MULTIWAY SELECTION :
In addition to two-way selection, most programming languages provide another selection concept known as multiway

selection. Multiway selection chooses among several alternatives. C has two different ways to implement

multiway selection: the switch statement and else-if construct

If for suppose we have more than one valid choices to choose from then we can use switch statement in place of if statements.

```
        switch(expression)
{.
        case value-1:
                block-1
                break;
        case value-2:
                block-2
                break;


        - - - - - .
        -------- .
        default:
                default block;


}
```
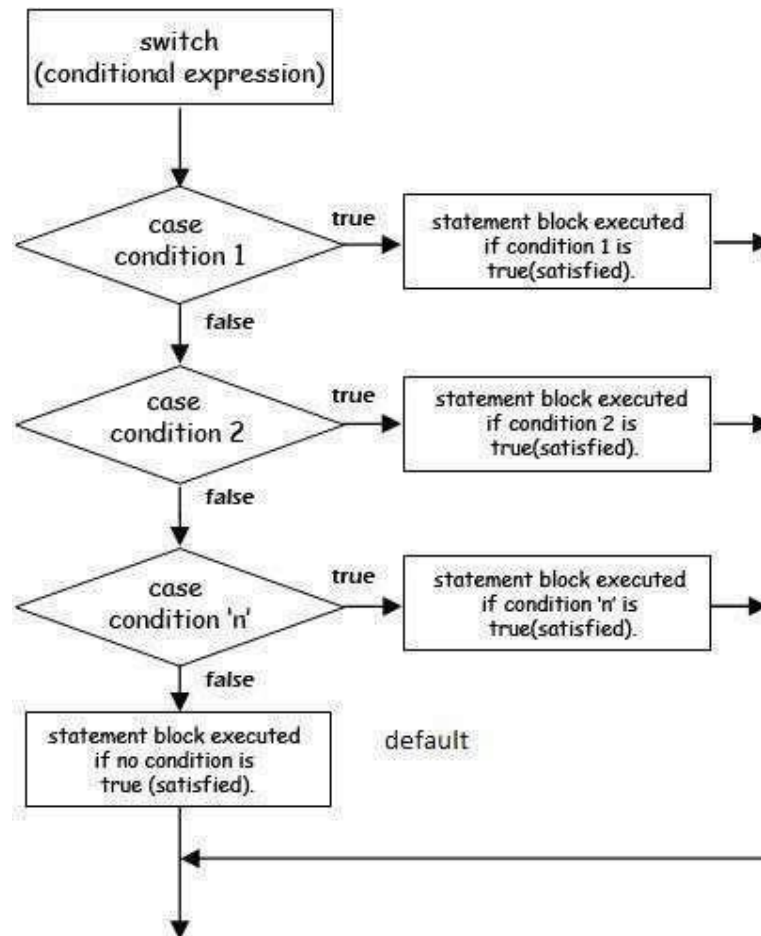

/*program to simulate a simple calculator */

```cpp
#include<iostream.h>
int main()
{
float a,b;
char opr;



cout<<"Enter number1 operator number2 : ";
cin>>a>>oper>>b;
```

```
switch(opr)
{
```

```
  case '+':
         cout<<"Sum : "<<(a + b)<<endl;
          break;
  case '-': cout<<"Difference : "<<(a -b)<<endl;
         break;
  case '*': cout<<"Product : "<<a * b<<endl;
         break;
  case '/': cout<<"Quotient :"<<(a / b)<<endl;
         break;
  default: cout<<"Invalid Operation!"<<endl;
  }
  return 0;
  }
```

Some Examples

1)Ladder + Nesting

An electronics shop has announced the following seasonal discounts on the purchase of certain items.

Purchase Amount in Rs.	Discount on Laptop	Discount on Desktop PC
0 - 25000	0.0%	5.0%
25001 – 57000	5.0%	7.5%
57000 - 100000	7.5%	10.0%
More than 100000	10.0%	15.0%

Write a program based on the above criteria, to input name, address, amount of purchase and the type of purchase (L for Laptop and D for Desktop) by a customer. Compute and print the net amount to be paid by a customer along with his name and address.

(Hint :   discount = discount rate/100) * amount of purchase
            Net amount = amount of purchase – discount)

include <iostream>

using namespace std;

int main(){

  string name,address;

  double amount,discount;

  char type;

```cpp
cout<<"enter your name:";

cin>>name;

cout<<"enter your address:";

cin>>address;

cout<<"please select your catagory  'L' for laptop and 'D' for desktop   ";

cin>>type;

cout<<"enter amount of purchase:";

cin>>amount;

cout<<"Your Bill"<<endl;

cout<<"Name:"<<name<<endl;

cout<<"Address:"<<address<<endl;




if(type=='L'){
  if(amount>0 && amount<=25000){
      cout<<"no discount ,Total amount "<<amount;
      }
      else if(amount>=25001 && amount<=57000){
              discount=amount*(5.0/100);
              cout<<"discount:"<<discount<<"amount paid:"<<amount-discount;
      }
      else if(amount>=57001 && amount<=100000){
              discount=amount*(7.5/100);
              cout<<"discount:"<<discount<<"amount paid:"<<amount-discount;
      }
      else if(amount>100000){
              discount=amount*(10.0/100);
              cout<<"discount:"<<discount<<"amount paid:"<<amount-discount;
      }
  }
  else if (type=='D'){
      if(amount>0 && amount<=25000){
```

```cpp
        discount=amount*(5.0/100);

    cout<<"discount:"<<discount<<"amount paid:"<<amount-discount;

    }
    else if(amount>=25001 && amount<=57000){

        discount=amount*(7.5/100);

        cout<<"discount:"<<discount<<"amount paid:"<<amount-discount;

    }
    else if(amount>=57001 && amount<=100000){

        discount=amount*(10.0/100);

        cout<<"discount:"<<discount<<"amount paid:"<<amount-discount;

    }
    else if(amount>100000){

        discount=amount*(15.0/100);

        cout<<"discount:"<<discount<<"amount paid:"<<amount-discount;

    }
  }
}
```

Example 2

If-else

A shop will give discount of 10% if the cost of purchased quantity is more than 1000.

Ask user for quantity

Suppose, one unit will cost 100.

Judge and print total cost for user.

```cpp
# include<iostream>
using namespace std;
int main(){
    double quantity,total,discount;
    cout<<"enter purchased quantity";
    cin>>quantity;
    total=quantity*100;


if(total>1000)    {
    discount=total*(10.0/100);
    cout<<"discount:"<<discount<<endl;
    cout<<"u have to pay:"<<total-discount;
    }
  else{
  cout<<"no discount ";
      cout<<"u have to pay:"<<total;
    }


}
```

Example3 Switch

```cpp
# include <iostream>
using namespace std;



int main(){
    char ch;
    int len,bre,side;
    cout<<"please select any one of them \n";
    cout<<"R for rectangle\nS for square\n";
  cin>>ch;
```

```cpp
switch(ch){
 case 'R': cout<<"enter length and bredth :";
      cin>>len>>bre;
      cout<<"Area:"<<len*bre;



  case 'S': cout<<"enter side :";
       cin>>side;
       cout<<"Area:"<<side*side;



  default:  cout<<"invalid choice ";
 }
}
```