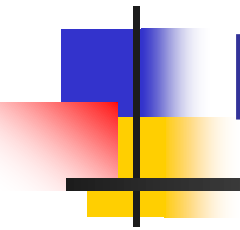
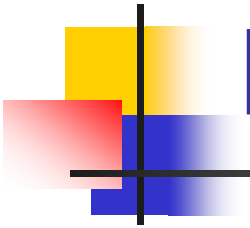


Loops

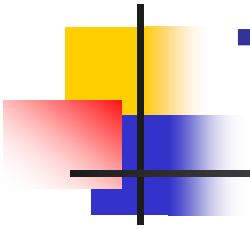


Loops

- Loops cause a section of program to be repeated certain number of times.
- As long as condition remains true, the repetition continues, when the condition becomes false, the loop ends and the control passes to the statement following the loop.

There are three kinds of loops in C/C++.

i) for loop
ii) while loop
iii) do while loop



The for loop

- The for loop executes a section of code a fixed number of times.
- “for loop” is used normally when we know, before entering the loop, that how many times we want to execute the code.

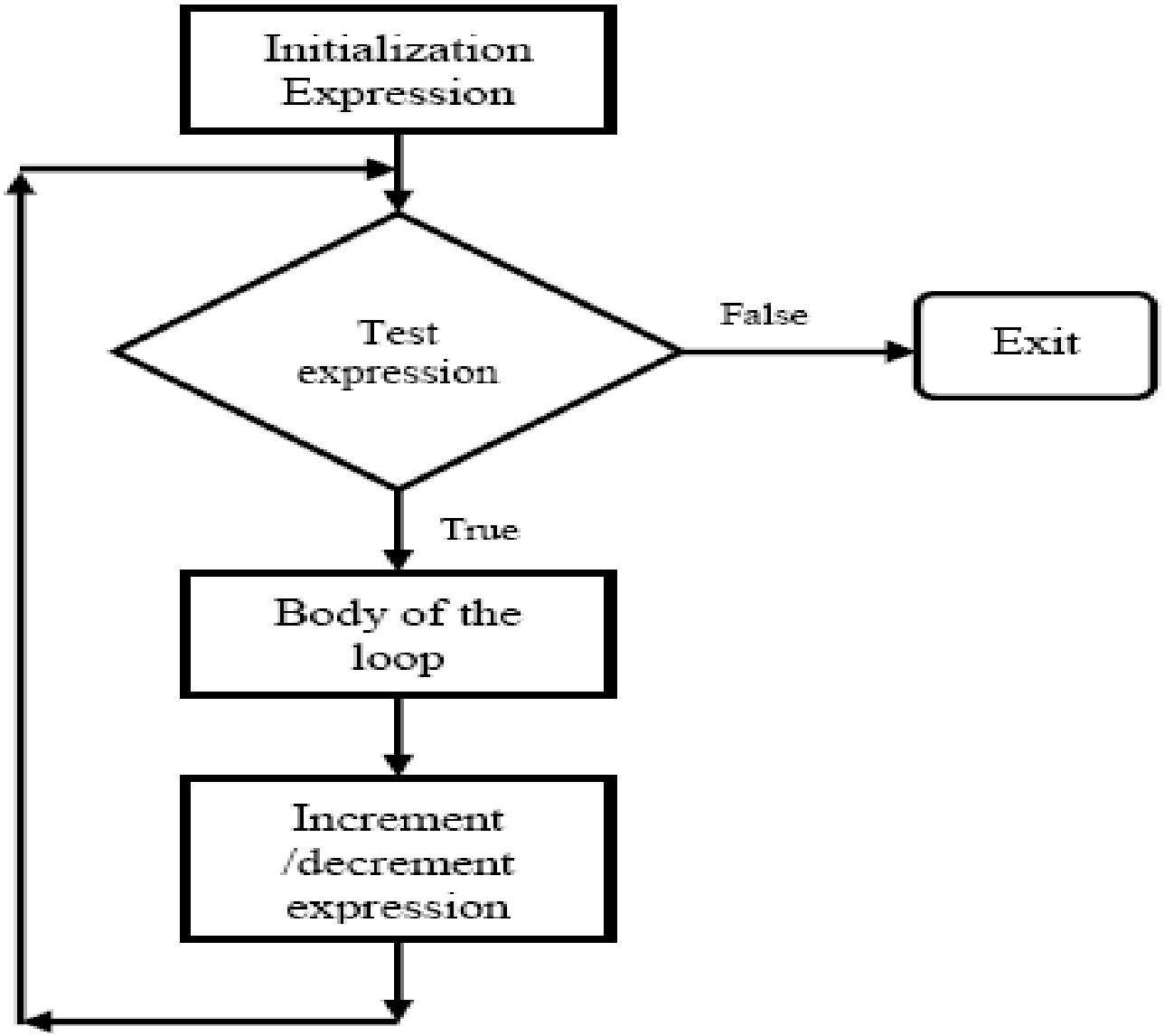
The for loop

```
#include <iostream.h>
#include <conio.h>
void main(void)
{  clrscr();
     int sum=0;
     for(int a=1;a<=10;a++)
     {
         cout<<a<<"\t"<<(11-a)<<endl;
         sum += a;
     }
     cout<<"Sum is "<<sum;
     getch();
     }
```

Output

```
1 10
2 9
3 8
4 7
5 6
6 5
7 4
8 3
9 2
10 1
Sum is 55
```

Operation of for loop

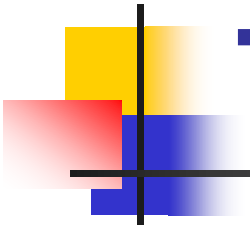


Factorial !

```
#include <iostream.h>
#include <conio.h>
void main(void)
{    clrscr();
     int num, fact=1;
     cout<<"Enter a number ";
     cin>>num;
     for(int a=num;a>0;a--)
     {
        fact *= a;
     }
     cout<<"Factorial of "<<num<<" is "<<fact;
     getch();
}
```

Nested for loop

```
#include <iostream.h>
#include <conio.h>
void main(void)
{    clrscr();

      for(int a=1;a<=2;a++)
      {
            for(int b=1;b<=3;b++)
             {
                        cout<<"A is "<<a<<" & B is "<<b<<endl;
             }
      }
      getch();
}
```



The while loop

- Normally in “for loop” we have an idea that how many times we want to execute a section of code
- but “while loop” is used when even before starting the loop we have no idea that how many times a section of code will be executed.
- Like for loop, while loop contains a test expression but there is no initialization or increment/decrement expression etc.

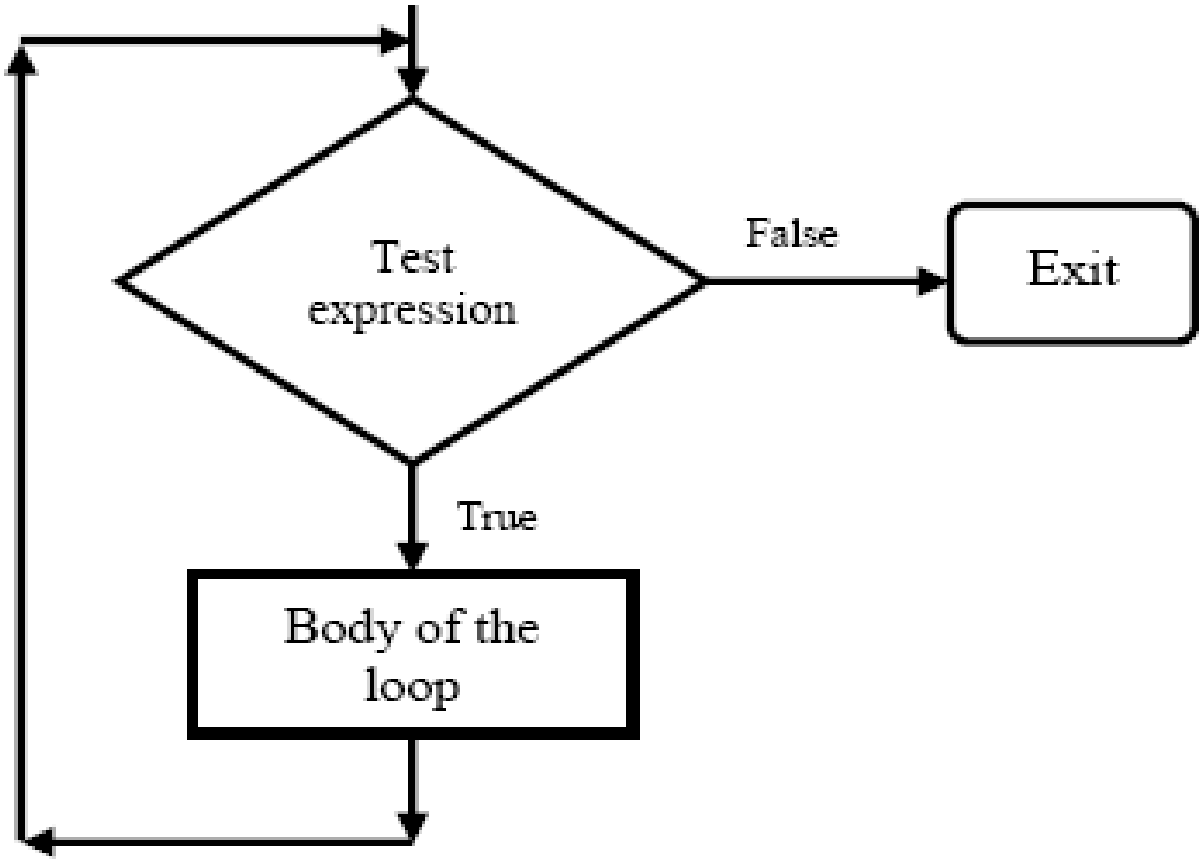
The while loop

```
#include <iostream.h>
#include <conio.h>
void main(void)
{   clrscr();
    int a=1;
    while(a<=10)
    {
       cout<<a<<"\t"<<(11-a)<<endl;
       a++;
    }
    getch();
}
```

Output

```
1 10
2 9
3 8
4 7
5 6
6 5
7 4
8 3
9 2
10 1
```

Operation of while loop

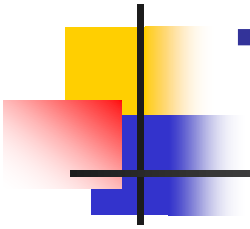


The while loop

```
#include <iostream.h>
#include <conio.h>
void main(void)
{   clrscr();
    int a=0;
    while(a!=100)
    {
       cout<<a<<"\t"<<(100-a)<<endl;
       a=a+25;
    }
    getch();
}
```

The while loop

```
#include<iostream.h>
#include<conio.h>
void main(void)
{    clrscr();
      int a=15;
      while(a<1 || a>10)
      {
           cout<<"Enter a value (1-10) ";
            cin>>a;
      }
      cout<<"Value entered is between 1 - 10";
      getch();
}
```



The do while loop

- The do while loop is used when we want to guarantee that the loop body should execute at least once, whatever the initial state of the test expression contains.
- In do while loop, the test expression is placed at the end of the loop.

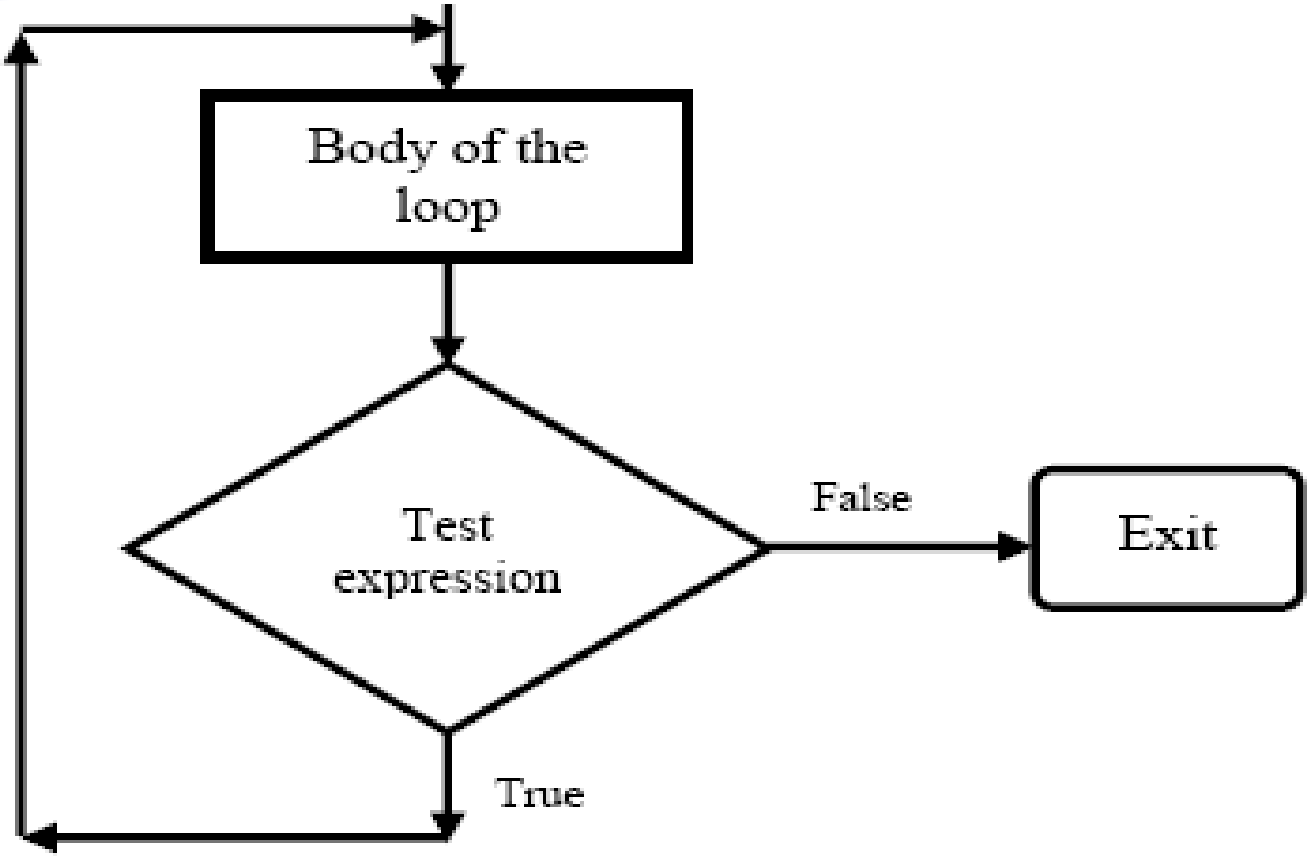
The do while loop

```
#include<conio.h>
void main(void)
{
      clrscr();
       int a=1;
       cout<<"Value\tSquare\tCube"<<endl;
       do
       {
           cout<<a<<"\t"<<a*a<<"\t"<<a*a*a<<endl;
             a++;

       }while(a<=10);

       getch();
}
```

Output

Value	Square	Cube
1	1	1
2	4	8
3	9	27
4	16	64
5	25	125
6	36	216
7	49	343
8	64	512
9	81	729
10	100	1000

Operation of do while loop



The do while loop

```
#include<iostream.h>
#include<conio.h>
void main(void)
{ char ch;
   int t;
   do
       {   clrscr();
           cout<<"Enter Table value ";
           cin>>t;

           for(int a=1;a<=10;a++)
                 cout<<t<<" x "<<a<<" = "<<t*a<<endl;

           cout<<"Press Y to Continue ";
           ch=getche();
      }while(ch=='Y' || ch=='y');
  cout<<"\nThanks for using program";
  getch();
}
```

Output

```
Enter Table value 4
4 x 1 = 4
4 x 2 = 8
4 x 3 = 12
4 x 4 = 16
4 x 5 = 20
4 x 6 = 24
4 x 7 = 28
4 x 8 = 32
4 x 9 = 36
4 x 10 = 40
Continue n
Thanks for using program
```