Constructors

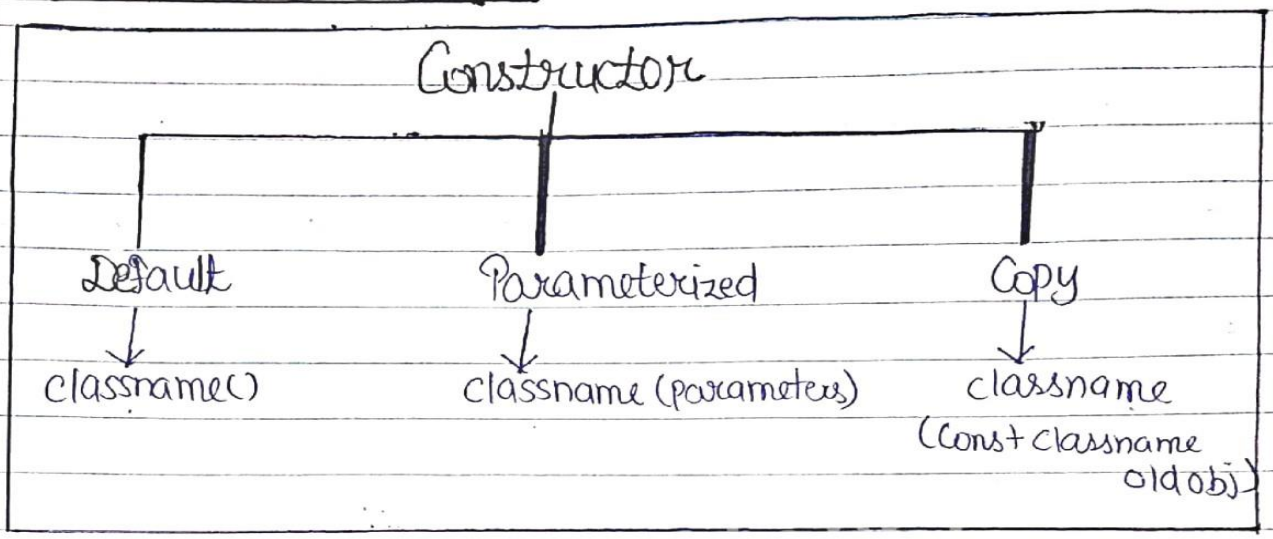
Introduction :-

- A Constructor is a special type of member function of class.
- It is called automatically when an object is created of that class
- It has same name as that of class name
- It does not have a return type
- To create a constructor, use the same name as the class, followed by parentheses ()

For Example :-

```
class abc
{
public:
abc()
{
cout<<"hello";
}
};
```

Types of Constructor



1 Default Constructors :-

- A Constructor which has no argument is known is default constructor. (Parameters)
- When the class does not contain a constructor the compiler automatically supplies a default Constructor with no arguments.

Program for Default Constructors

```
#include<iostream.h>
#include<conio.h>
```

```
class student
 {
  public:
  student()
  {
  cout << " Default Constructor";
  }
};
  void main()
  {
  clrscr();
  student s;
  getch();
  }
```

Output :- Default Constructor

2. Parameterized Constructor

- A Constructor which has parameters is called parameterized Constructor.
- It is used to provide different values to objects.

WAP to show Parameterized Constructor :-

```
#include<iostream.h>
#include<conio.h>
class student
{
public:
int id;
int rn;
student (int i, int r)
{
id = i;
rn = r;
}
void show()
{
cout << id << "  " << rn;
}
};
void main()
{
clrscr();
student s = student (1, 101);
s.show();
getch();
}
```

Output :- 1 101

3° Copy Constructor

The copy constructor in C++ is used to copy data of one object to another.

It is used to copy the value of one object into another object is called Copy Constructor.

Syntax:-
```
classname (classname &ref)
{
  // code;
}
```

→ A Copy Constructor takes a ref to an object of the same class as an argument.

for e.g.:-
```
student S1;  // default constr.
student S2 = S1;  // Copy Constructor is called
```

Progrm for Copy Constructor.

```
#include<iostream.h>
#include<conio.h>
class student
{
```

```
    int id;
    int rollno;
    public
     {
     student (int i, int r)
      {
      id = i;
      rollno = r;
     }
     student (student &stu)
       {
       id = stu.id;
      rollno = stu.rollno;
     }
     void show()
      {
      cout << id << " " << rollno;
    }
};
    void main()
     {
     student s1(1, 101);
     student s2 = s1;
     s1.show();
     getch();
}
```

Output:- 1 101

* Multiple Constructors in class
or
Constructor Overloading in C++

- In C++, we can have more than one constructor in a class with same name, each has a different list of arguments.
- This concept is also known as Constructor Overloading.
- It is quite similar to function overloading.
- Overloaded constructors have the same name (name of the class) but the different number of arguments.
- A constructor is called depending upon the number and type of arguments is passed.

Syntax:-
```
class classname
{
    classname()
    {
```

```
    ---
    }
    classname (arg1, arg2)
    {
      ---
    }
};
```

(Program)

WAP to show the concept of Constructor Overloading or multiple Constructor in class.

```
#include<iostream.h>
#include<conio.h>

class add
 {
  public:
  int c;
  add()  // Constructor with no arguments
   {
   c=0;
  }
    // Constructor with two arguments
add (int a, int b)
   {
```

```
        c= a+b;
    }
    void show()
    {
    cout<< c << endl;
    }
};

void main()
{
clrscr();
add obj;                    // Constructor Overloading
add obj2(10,20);              with two different
obj.show();                   constructors of class name

obj2.show();
getch();
}
```

Output:-

0

30

⊛ Dynamic Initialization of Objects

- It means Intial value may be provided during runtime.
- Dynamic Initialization of object refers to initializing the objects at run time, the intial value of an object is provided during run time.
- Example:

```
student (int i, int m)
{
    id = i;
    marks = m;
}
main() {
    student (x,y);
}
```

dynamic initialization with values x, y.

Program :-

```
#include<iostream.h>
#include<conio.h>
class student
{
```

```
int id;
float marks;
public:
student (int i, float m)
 {
  id = i;
  marks = m;
 }
  void show()
   {
   cout << id << endl;
   cout << marks;
   }
};
   void main()
    {
     int a;
     float b;
    cout << "Enter student Id";
    cin >> a;
    cout << "Enter marks";
    cin >> b;
    student s (a,b);
     s.show();
     getch();
    }
```

Output:

```
Enter Id = 1
Enter marks 200
        1   200
```

* Destructors :-

- Destructor is used to destory the objects that have been created by Constructor.
- A destructor work opposite to constructor. It destructs the objects of classes.
- It can be defined only once in a class.
- It is defined like constructor. It must have same name as Class.
  But It is prefixed with a tilde sign (~).

Note :- C++ destructor cannot have modifiers.

Syntax:

```
class classname
{
public :
~classname()
 {
 }
};
```

Program of Destructor

```
#include<iostream.h>
#include<conio.h>
class student
{
public:
student()
{
cout<<" Constructor called "<<endl;
}
~student()
{
cout<<" Destructor called" ;
}
};
void main()
{
student s;
getch();
}
```