Todays Topic

- OOPS
  - Classes
  - Objects
  - Data Members
  - Member Functions

OOPS – Object Oriented Programming System

Java is an object oriented language.

It provides us a programming environment where we can create objects and can perform operations on them.

The main features of object oriented language are

1. Data Abstraction and Encapsulation
2. Inheritance
3. Polymorphism

Objects

Objects

Components of Objects

- **Data**
  - PenColor
  - InkColor
  - InkQty
  - Length
  - Radius
  - Company
  - Price
- **Functions**
  - Fill( )
  - Write( )
  - Throw( )

- **Class**
- A class is a blue print of an object.
- We can say it is generic description of an Object.

- Definition:
  - A class is a user defined data type where we can group data and its related functions together.

```
class className
{
    Data Members
    . . . . .
    . . . . .
    Member Functions
    . . . . .
    . . . . .
}
```

Data members:

- indicates information about the object or current status of object.

Syntax:

```
[AccessSpecifier] [Modifier] datatype memberName [=value] ;
```

```
class className
{
    Data Members
    . . . . .
    . . . . .
    Member Functions
    . . . . .
    . . . . .
}
```

Member functions :

It indicates the operations that we perform on the object.

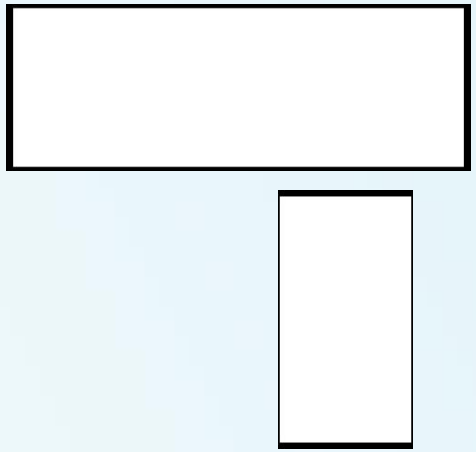
Syntax:

```
[AccessSpecifier] [Modifier]  returntype fName(datatype arg1, , . )
    {
    Statements.....
    ..........................
    return value;
    }
```

```
class className
{
    Data Members
    . . . . .
    . . . . .
    Member Functions
    . . . . .
    . . . . .
}
```

For ex:

```
class Rectangle
{
int length;
int breadth;
void area( )
      {
      int a=length*breadth;
      System.out.println('Area is "+a);
      }
void perimeter( )
      {
      int p=2*(length+breadth);
      System.out.println('Perimeter  is "+p);
      }
}
```



Data members
- Length
- Breadth

Member Functions
- Area()
- Perimeter()

[AccessSpecifier] [Modifier] datatype memberName [=value] ;

[AccessSpecifier] [Modifier] returntype fName(datatype arg1, , .)

```
{
Statements…..
……................
return value;
}
```

```
class box
{
 int L,B,H;
 void volume( )
            {
            int v = L * B * H ;
            System.out.println('Volume  is " + v ) ;
            }
}
```

Design a class box containing data members length,breadth & height and member function volume.

[AccessSpecifier] [Modifier] datatype memberName [=value] ;

[AccessSpecifier] [Modifier] returntype fName(datatype arg1, , .)

{
Statements…..
…….
return value;
}

```
class Circle
{
 int R;
 void area( )
    {
    double a = 3.14 * R * R ;
   System.out.println("Area  is " + a ) ;
   }
void circuimference( )
    {
    double c = 2 * 3.14 * R ;
   System.out.println("Circumference  is " + c ) ;
   }
}
```

Design a class Circle containing data members radius and member functions area & circumference.

[AccessSpecifier] [Modifier] datatype memberName [=value] ;

[AccessSpecifier] [Modifier] returntype fName(datatype arg1, , .)
{
Statements…..
……
return value;
}

```
class Set
{
 int n1, n2, n3;
 void sum( )
    {
    int s = n1 + n2 + n3 ;
   System.out.println("Sum is " + s ) ;
   }
void mean( )
    {
    double m = ( n1 + n2 + n3 ) / 3.0;
   System.out.println("mean  is " + m ) ;
   }
}
```

Design a class set containing data members n1, n2, n3 and member functions sum & mean.

[AccessSpecifier] [Modifier] datatype memberName [=value] ;

[AccessSpecifier] [Modifier] returntype fName(datatype arg1, , .)

{

Statements…..

……

return value;

}

```
class MarkSheet
{
 int eng, hin, mar, mat, sci ;
 void total( )
   {
   int t = eng + hin + mar + mat + sci ;
  System.out.println("Total is " + t ) ;
  }
void percentage( )
   {
   int t = eng + hin + mar + mat + sci ;
   double p = t * 100 / 500.0;
  System.out.println("Percentage  is " + p ) ;
  }
void result( )
   {
   if ( eng>=40 && hin>=40  && mar>=40 && mat>=40 && sci >=40)
            System.out.println("Student is passed " ) ;
  else
            System.out.println("Student is failed " ) ;
  }
}
```

Design a class MarkSheet containing
data members: eng, hin, mar, mat, sci
member functions: total( ), percentage( ), result( )

[AS] [M] datatype memberName [=value] ;

```
[AS] [M]  returntype fName(datatype arg1, , . )
      {
      Statements…..
      ……................
      return value;
      }
```

Todays Topic End