Topics

- Accessing Class Members
  - Accessing Instance Fields of a Class
  - Invoking Methods of a Class
  - Implicit vs Explicit Parameters
  - Use of ‘this’ reference pointer

What is the Problem?

- Problem

Instance Fields

Constructor Method

```
class XYZ
{
        private     int     x;
        private     double  y;
        // Constructor Method
        XYZ(int a, double b)
        {
                x=a; y = b;
        }// End of Constructor
        // Method to Read the Value of  x
        public      int     getX()
        {
                return x;
        } // End of Method
        // Method to get the value of y
        public      int     getY()
        {
                return y;
        }
}// End of class XYZ
// Driver Class
class Test
{
        public static void main(String args[])
        {
        // How to Access the Instance Fields and Methods of XYZ Here
        } // End of Method
}// end of class Test
```

What is the Access Mechanism

Accessing Object Methods and Fields of a Class

- Within (Inside the class) the class every instance field (even if it is private) and every object method is directly accessible.
- Outside the class only those Instance Fields and Object methods are accessible which are not private.
- Outside the class the Instance Fields and Object methods are accessed using object-references of that class
- Syntax for Accessing Non-private Instance Fields Outside the class

  <object-reference-name>.<instance-field-name>
- Syntax for Accessing Non-private Object Methods Outside the class

  <object-reference-name>.object-method-name();

  <object-reference-name>.object-method-name(parameters);

Example 1

```
// Fie Name : Demo.java
class XYZ
{
        private     int     x;
        private     double  y;
        // Constructor Method
        XYZ(int a, double b)
        {
                x=a;
                y = b;
        }// End of Constructor
        // Method to Read the Value of  x
        public      int     getX()
        {
                return x;
        } // End of Method
        // Method to get the value of y
        public      int     getY()
        {
                return y;
        } // End of Method

}// End of class XYZ
```

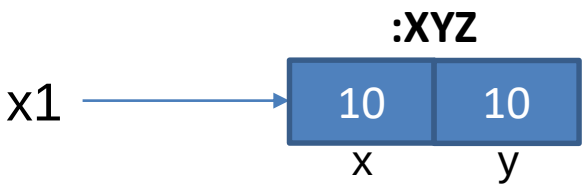
```
// Driver Class
class Test
{
   public static void main(String args[])
   {
        // How to Access Instance Fields and
        // Methods of XYZ class in Test class ?

        // Step 1 : Create an Instance of class XYZ
        XYZ  x1 =  new XYZ(10, 10);

        // Step 2: Access via instance reference
        int    a  =  x1.getX();

        int    b  =  x1.getY();

   } // End of Method
}// end of class Test
```



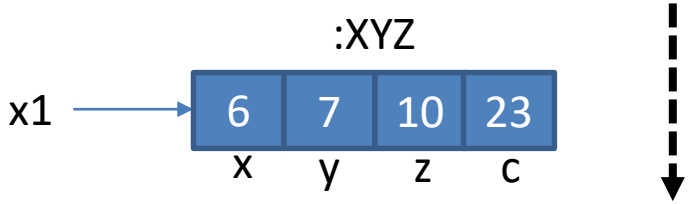
getX() and getY() Methods are accessed via object-reference x1

Example 2

```
// File Name : Demo.java
class XYZ
{
        private     int x;      // private instance field
                    int y;      // package-private instance field
        protected   int z;      // protected instance field
        public      int c;      // public instance field
        // Constructor Method
        XYZ(int A, int B, int C, int D)
        {
                    x = A;
                    y = B;
                    z = C;
                    c = D;
        }// End of Constructor
        // Method to getSum of instance fields
        public  int     getSum()
        {
                    return x + y + z + c;
        }// End of Method
        // Method displays the instance field values
        public void     display()
        {
                    System.out.println("x = " + x);
                    System.out.println("y = " + y);
                    System.out.println("z = " + z);
                    System.out.println("c = " + c);
        }// End of Method
}// End of class XYZ
```

```
// Driver class Test
class Test
{
        public static void main(String[] args)
        {
                    XYZ x1 =new XYZ(6,7, 10, 23);
                    // x1.x = 13;
                    x1.y = 20;
                    x1.z = 40;
                    x1.c = 60;

        }// End of Method
}// End of class Test
```



Erroneous Statement: as ‘x’ is private in class XYZ

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                    System.out.println("c = " + c);
        }// End of Method
}// End of class XYZ
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```
// Driver class Test
class Test
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                    x1.c = 60;

        }// End of Method
}// End of class Test
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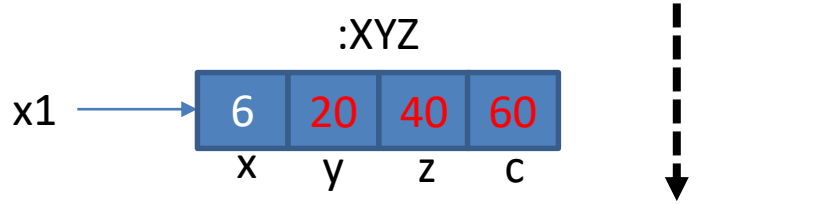

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        // Constructor Method
        XYZ(int A, int B, int C, int D)
        {
                    x = A;
                    y = B;
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        // Method to getSum of instance fields
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                    return x + y + z + c;
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        // Method displays the instance field values
        public void     display()
        {
                    System.out.println("x = " + x);
                    System.out.println("y = " + y);
                    System.out.println("z = " + z);
                    System.out.println("c = " + c);
        }// End of Method
}// End of class XYZ
```
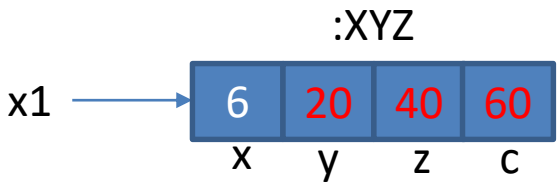

```
// Driver class Test
class Test
{
        public static void main(String[] args)
        {
                    XYZ x1 =new XYZ(6,7, 10, 23);
                    // x1.x = 13;
                    x1.y = 20;
                    x1.z = 40;
                    x1.c = 60;
                    x1.display();
        }// End of Method
}// End of class Test
```




```
F:\>java Test
x = 6
y = 20
z = 40
c = 60
```

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Implicit vs Explicit Method Parameters

- Any object in memory referenced by a object-reference-variable ‘r’ is the implicit parameter to any method which is invoked via ‘r’
- Explicit parameters are the part of method signature
- Example

```
class XYZ
{
        ……..
        public    void    doS( int a, int b )
        {
                ……..
        } // End of Method
}// End of class XYZ
```

Explicit Parameters for doS()

```
// Driver Code
XYZ     x1 = new XYZ();

x1.doS(4,6);
```

‘x1’ is implicit parameter

Implicit Parameter Examples

```
// File Name : Demo.java
class AB
{
    private int a, b;  // Instance Fields
    // Constructor Method
    AB(int x, int y)
    {
        a = x; b = y;
    }// End of Method
    // Method to display instance field values
    public void display()
    {
        System.out.println(" a=  "+ a);
        System.out.println(" b = " +b);
    }// End of Method
}// End of class AB
```

```
// Driver Code
class Test
{
    public static void main(String args[])
    {
        AB  a1 = new AB( 4 , 8);
        AB  a2 = new AB( 3 , 5);
        AB  a3 = new AB( 7 , 21);
        AB  a4 = new AB( 2 , 9);

        a1.display();
        a2.display();
        a3.display();
        a4.display();

    }// End of Method

}// End of class Test
```

states of the objects referenced by variables 'a1' .. 'a4' are the default parameters for the display() method

Use of this pointer

- 'this' is a Java Keyword which always points to the object invoking the method (i.e. implicit parameter)
- 'this' pointer helps to differentiates the local-variables from instance fields especially when they have same name
- Example

```
class AB
{
        private int a;
        private int b;
        // Constructor Method
        AB(int a, int b)
        {
                this.a = a;
                this.b = b;
        }// End of Method
}// End of class AB
```

Instance Fields and constructor Arguments have Same name

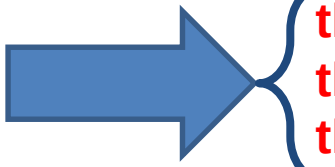
this.a refers to instance-field 'a'

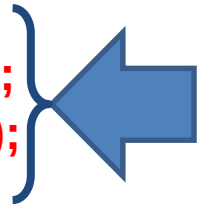
this.b refers to instance-field 'b'

this pointer Example

```
// File Name : Demo.java
class AB
{
        private int a;
        private int b;  // Instance Fields
        // Constructor Method
        AB(int x, int y)
        {
            this.a = x;
            this.b = y;
            this.display();      // you can write simple 'display()' also
        }// End of Method
        // Method to display instance field values
        public void display()
        {
            System.out.println(" a=  "+ this.a);
            System.out.println(" b = " +this.b);
        }// End of Method
}// End of class AB
```

Refer to Instance-fields via 'this'





Refer to Instance-fields via 'this'

Thank You