Wrapper Classes

- **Boxing & Unboxing**

- Types of variable

- In java a variable can be

    1. A reference to an object OR

    2. A primitive (int, double, char, Boolean etc)

- Advantages & Disadvantages of variables as Reference to objects:

Advantages:

- All objects inherit the buildin method equals(Object o) and toString() from the parent class.

- Every object can be upcast.

Disadvantages:

- Processing of objects can be overhead for processing speed.

So the designers of java decides that primitives would not be object

- **Wrapper Classes**

- Java provides wrapper classes.

- A class that "wrap" an object around a primitive value.

- Java provides both primitive data type "int" and also the class "Integer".

- Similarly Java provides both primitive data type "double" and also the class "Double".

Java provides a wrapper class for each primitive data type.

- List of wrapper classes

- Example of Wrapper class Integer

Primitive Variable declaration:

int x = 34;

- Properties of Wrapper Classes

- Each numeric class has one argument constructor.

- Example

  Integer x=new Integer(34);

- Properties of Wrapper Classes

- Each wrapper class, except character, has second constructor that accepts a String as argument

- Example

  Integer x=new Integer("34");

- But Integer x=new Integer(); is illegal.

- The character class has a single constructor

  Character c=new Character('a');

- Conversions

1. Primitive data type to reference or wrapper type

2. Reference or wrapper type to Primitive data type

- Converting Primitive data type *to* reference or wrapper type

int x=5;

Integer y=new Integer("10");

y= x;

System.out.println("x:" + x + " y:" +y);

- Converting reference or wrapper type *to* Primitive data type

int x=5;

Integer y=new Integer("10");

x=y;

System.out.println("x:" + x + " y:" +y);

- Autoboxing & autounboxing

- The automatic conversion of a primitive type to its corresponding wrapper (reference) type ia called autoboxing or automatic boxing.

- **Example:** Converting from int to Integer is autoboxing

- The conversion of wrapper object to its corresponding primitive type is called automatic unboxing or unboxing.

- **Example:** Converting from Integer to int is unboxing

- Wrapper Inherits

- All wrapper objects inherits two method of java classes

  - **boolean equal(object o)**

  - **String toString()**

Example

```
Integer x=new Integer(5);

Integer y=new Integer(6);

boolean result=x.equals(y);

System.out.println(result);  // output is false

String s=x.toString();

System.out.println(s);  // output is "5"
```