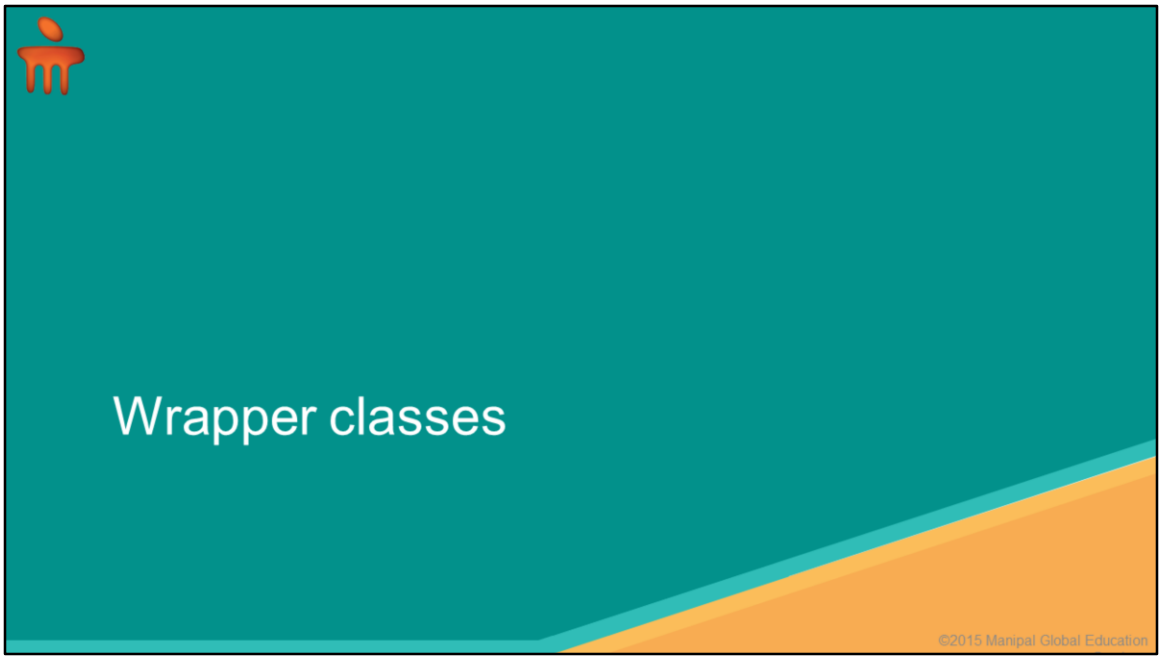
Wrapper classes
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LEARNING OBJECTIVES

At the end of this lesson, you will be able to:

- List the Wrapper classes Hierarchy
- Use methods of Wrapper classes
- Describe Auto boxing

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Refer package **com.mgait.api_classes** in the provided code base for demo programs on the topics covered in this presentation


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CONCEPT
Wrapper Classes
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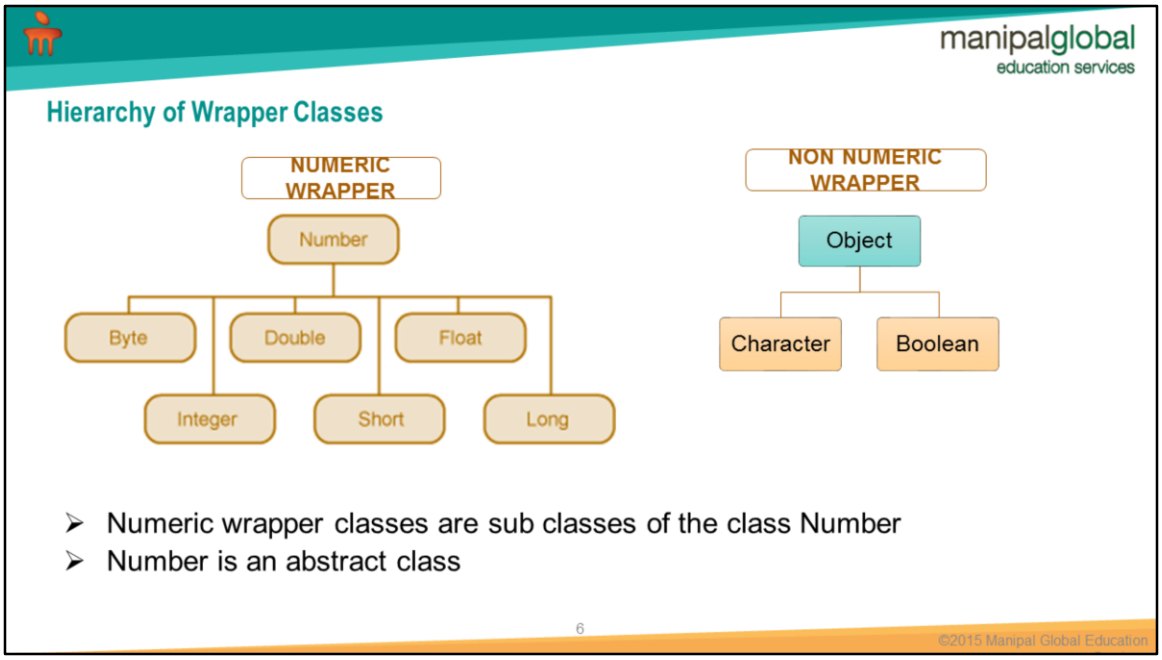
What are Wrapper Classes

- What
  - Wraps a value of the primitive type in an object

- Why
  - Primitives can be included in activities reserved for objects like collections
  - To provide utility functions for primitives like
    - Converting primitives to and from String objects
  - To use constants MIN_VALUE and MAX_VALUE, that provide the upper and lower bounds of the data type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Hierarchy of Wrapper Classes
NUMERIC WRAPPER
Number
Byte
Double
Float
Integer
Short
Long
NON NUMERIC WRAPPER
Object
Character
Boolean
Numeric wrapper classes are sub classes of the class Number
Number is an abstract class
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Constructors of Wrapper classes

```
//Character class provides one constructor
Character c = new Character('n');


//All other wrapper classes have overloaded
//Constructors
Double d = new Double(2346.23);
Double d1 = new Double("2346.23");

Boolean b = new Boolean(true);
Boolean b = new Boolean("false");

Integer i1 = new Integer("10");
Integer i2 = new Integer(10);
```

Primitive	Wrapper Class	Constructor Arguments
char	Character	char
boolean	Boolean	boolean or String
byte	Byte	byte or String
double	Double	double or String
float	Float	float, double, or String
int	Integer	int or String
long	Long	long or String
short	Short	short or String

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AutoBoxing and UnBoxing

- AutoBoxing
  - Automatic conversion of primitive datatypes in to its equivalent wrapper type

```
Integer i = 10;  //Boxing
```

- UnBoxing
  - Automatic conversion of wrapper in to its equivalent primitive data type

```
Integer i1 = new Integer("10");
int i2 = i1; //UnBoxing
```

- From java version 5 , Compiler does the boxing and unboxing automatically

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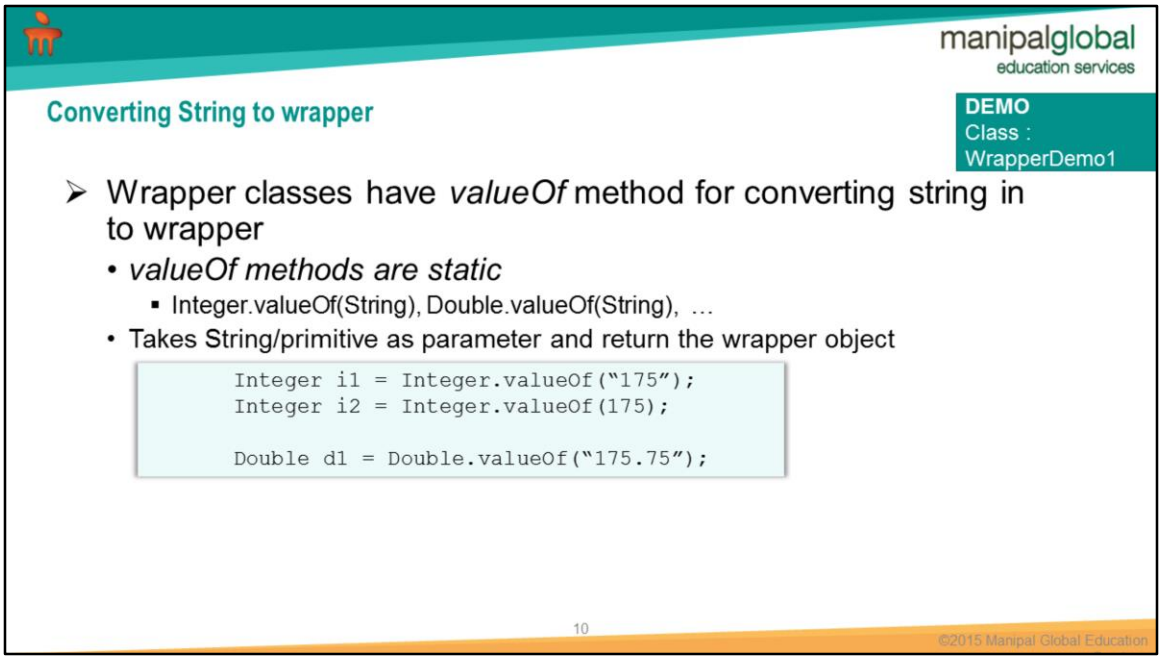
Converting String to primitive

- Wrapper classes have parse method for converting string in to primitive
  - parse methods are static
    - Integer.parseInt(String), Double.parseDouble(String), …
  - Takes String as parameter and return the primitive

```
String s1 = "225";
int i = Integer.parseInt(s1);     //Parsing String to int

String s2 = "225.25";
double d1 = Double.parseDouble(s2); //Parsing String to float
```

Applicable to all wrapper classes except Character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Converting String to wrapper
DEMO
Class :
WrapperDemo1
Wrapper classes have valueOf method for converting string in to wrapper
valueOf methods are static
Integer.valueOf(String), Double.valueOf(String), …
Takes String/primitive as parameter and return the wrapper object
Integer i1 = Integer.valueOf("175");
Integer i2 = Integer.valueOf(175);
Double d1 = Double.valueOf("175.75");
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NumberFormatException

- valueOf and parse methods throw NumberFormatException exception if the input string is invalid for given type

```
int err1 = Integer.parseInt("175.75");

Double err2 = Double.valueOf("ab");
```

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Converting primitive/wrapper to String

- Converting wrapper to String
  - toString() – non static method

```
Integer num = new Integer("10");
String str = num.toString();
```

- Converting primitive to String
  - toString() – static method

```
int num = 5;
String str = Integer.toString(num);
```

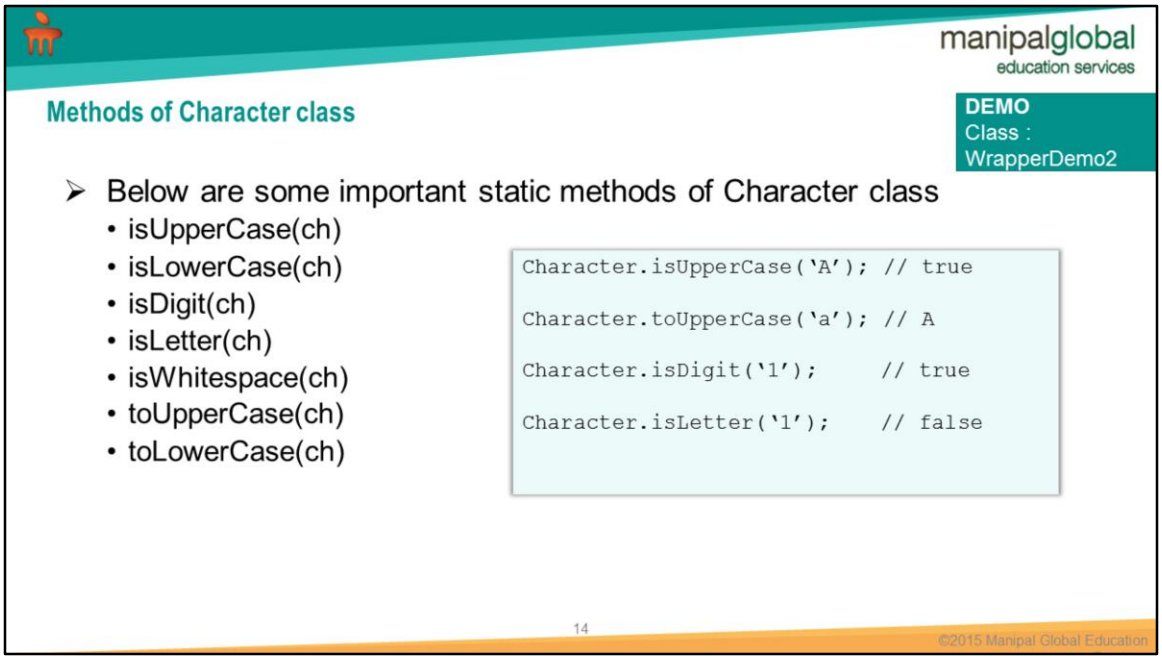
Converting to Hexadecimal/Binary String representation

- toHexString(..) – static method
  - Returns a string representing the hexadecimal value of the named primitive
  - Applicable to int, long, float and double

```
String str = Integer.toHexString(225);
// value of str will be "e1"
```

- toBinaryString(..) – static method
  - Returns a string representing the binary value of the named primitive
  - Applicable to int and long

```
String str = Integer.toBinaryString(6);
// value of str will be "110"
```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Methods of Character class
DEMO
Class :
WrapperDemo2
Below are some important static methods of Character class
isUpperCase(ch)
isLowerCase(ch)
isDigit(ch)
isLetter(ch)
isWhitespace(ch)
toUpperCase(ch)
toLowerCase(ch)
Character.isUpperCase('A'); // true
Character.toUpperCase('a'); // A
Character.isDigit('1'); // true
Character.isLetter('1'); // false
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QUIZ

- Is this valid? If not, then correct it

```
Character c = new Character("Java");
```

Character constructor can take only char argument

- Is the following code valid? If so, what is the output?

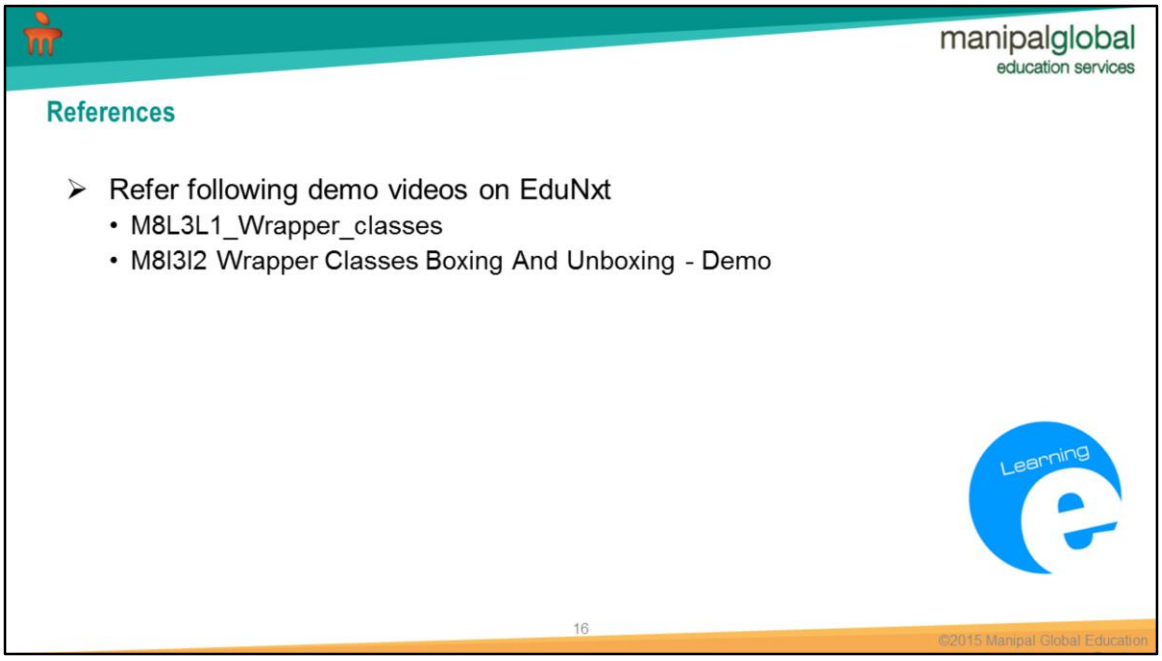
```
Boolean b = new Boolean("Java");
System.out.println(b);
```

false(Any value other than true is considered as false)

- Is this correct?

```
Number n = new Number();
```

Number class is abstract and cannot be instantiated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References
Refer following demo videos on EduNxt
M8L3L1_Wrapper_classes
M8l3l2 Wrapper Classes Boxing And Unboxing - Demo
Learning
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SUMMARY
Wrapper Classes
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SUMMARY

In this lesson, you've learned to:

- List the Wrapper classes Hierarchy
- Use methods of Wrapper classes
- Describe Auto boxing