Strings, StringBuilder, StringBuffer

String

- Strings in java are immutable
- Once created they cannot be altered and hence any alterations will lead to creation of new string object

Example

- String s1 = “Example”
- String s2 = new String(“Example”)
- String s3 = “Example”
- The difference between the three statements is that, s1 and s3 are pointing to the same memory location i.e. the string pool. s2 is pointing to a memory location on the heap.
- Using a new operator creates a memory location on the heap.
- Concatinating s1 and s3 leads to creation of a new string in the pool.

StringBuffer

- StringBuffer is a synchronized and allows us to mutate the string.
- StringBuffer has many utility methods to manipulate the string.
- This is more useful when using in a multithreaded environment.
- Always has a locking overhead.

Example

```
public class mybuffers{
    public static void main(String args[]){
        StringBuffer buffer =  new StringBuffer(“Hi”);
        buffer.append(“Bye”);
        System.out.println(buffer);
    }
}
```

- This program appends the string Bye to Hi and prints it to the screen.

Difference in String & StringBuffer

no	String	StringBuffer
1)	The String class is immutable.	The StringBuffer class is mutable.
2)	String is slow and consumes more memory when we concatenate too many strings because every time it creates new instance.	StringBuffer is fast and consumes less memory when we concatenate t strings.
3)	String class overrides the equals() method of Object class. So you can compare the contents of two strings by equals() method.	StringBuffer class doesn't override the equals() method of Object class.
4)	String class is slower while performing concatenation operation.	StringBuffer class is faster while performing concatenation operation.

StringBuilder class

- Java StringBuilder class is used to create mutable (modifiable) String. The Java StringBuilder class is same as StringBuffer class except that it is non-synchronized. It is available since JDK 1.5.

StringBuilder class

- Important Constructors of StringBuilder class

Constructor	Description
StringBuilder()	It creates an empty String Builder with the initial capacity of 16.
StringBuilder(String str)	It creates a String Builder with the specified string.
StringBuilder(int length)	It creates an empty String Builder with the specified capacity as length.

StringBuilder class methods

Method	Description
public StringBuilder append(String s)	It is used to append the specified string with this string. The append() method is overloaded like append(char), append(boolean), append(int), append(float), append(double) etc.
public StringBuilder insert(int offset, String s)	It is used to insert the specified string with this string at the specified position. The insert() method is overloaded like insert(int, char), insert(int, boolean), insert(int, int), insert(int, float), insert(int, double) etc.
public StringBuilder replace(int startIndex, int endIndex, String str)	It is used to replace the string from specified startIndex and endIndex.
public StringBuilder delete(int startIndex, int endIndex)	It is used to delete the string from specified startIndex and endIndex.
public StringBuilder reverse()	It is used to reverse the string.
public int capacity()	It is used to return the current capacity.
public char charAt(int index)	It is used to return the character at the specified position.
public int length()	It is used to return the length of the string i.e. total number of characters.
public String substring(int beginIndex)	It is used to return the substring from the specified beginIndex.

StringBuffer & StringBuilder class difference

No.	StringBuffer	StringBuilder
1)	StringBuffer is *synchronized* i.e. thread safe. It means two threads can't call the methods of StringBuffer simultaneously.	StringBuilder is *non-synchronized* i.e. not thread safe. It means two threads can call the methods of StringBuilder simultaneously.
2)	StringBuffer is *less efficient* than StringBuilder.	StringBuilder is *more efficient* than StringBuffer.
3)	StringBuffer was introduced in Java 1.0	StringBuilder was introduced in Java 1.5