Importance of SCP and Immutability :

1) String is the most widely used data type over the world in any programming language.
2) So sun microsystem identified this and hence they bought the concept of String Constant Pool in Java.
3) As duplicate objects are not allowed in SCP (String Constant Pool) and same object is used by multiple references, hence it makes program very memory efficient and improves performance.
4) But the disadvantage of this implementation is even if one reference tries to change the string object content it will change the content of all other reference which are pointing to this string object.
5) To overcome this drawback, string is made immutable so that if multiple reference are pointing to same object and even if one reference tries to change the content, then immediately new string object will be created instead of making changes in existing object.
6) As string is immutable, whenever there is any runtime change in string object then new object will be created in HEAP Area.

Note : In final keyword, we can't reassign reference variable some other value. In immutable, you can't change the content itself.

String Constructors:

1. String s=new String();
   Creates an empty String Object.
2. String s=new String(String literals);
   To create an equivalent String object for the given String literal on the heap.
3. String s=new String(StringBuffer sb);
   Creates an equivalent String object for the given StringBuffer.
4. String s=new String(char[] ch);
   Creates an equivalent String object for the given char[ ] array.
   For ex. char [] ch ={'a', 'e', 'i','o','u'};
           String s = new String(ch);
5. String s=new String(byte[] b);
   Create an equivalent String object for the given byte[] array.

Important methods of string class :

1) public char charAt(int index);
   Returns the character locating at specified index.
2) public String concat(String str);
3) public boolean equals(Object o);
   Used for case sensitive comparision
4) public boolean equalsIgnoreCase(String s);
   For content comparison where case is not important.
5) public String substring(int begin);
   Return the substring from begin index to end of the string.
6) public String substring(int begin, int end);
   Returns the substring from begin index to end-1 index.
7) public int length();
   Returns the number of characters present in the string.
8) public String replace(char old, char new);
   To replace every old character with a new character.
9) public String toLowerCase();
   Converts the all characters of the string to lowercase.
10) public String toUpperCase();
    Converts the all characters of the string to uppercase.
11) public String trim();
    We can use this method to remove blank spaces present at beginning and end of the string but not blank spaces present at middle of the String.

12) public int indexOf(char ch);
    It returns index of 1st occurrence of the specified character if the specified character is not available then return -1.
13) public int lastIndexOf(Char ch);
    It returns index of last occurrence of the specified character if the specified character is not available then return -1.

Difference between String, String Buffer and String Builder (Self Assignment)

How to create our own immutable class (Self Assignment)

Design the program to display velocity message on screen

```java
package com.sample;

public class SampleTest {

	public static void main(String[] args) {

		String str = "velocity";
		System.out.println("Institute name is>>" + str);
	}
}
```

Design the program to perform the string operation

```java
package com.sample;

public class SampleTest {

	public static void main(String[] args) {

		String str = "velocity";
		System.out.println(str.length());
		System.out.println(str.charAt(4));
		System.out.println(str.equals("velocity"));
		System.out.println(str.concat("pune"));
		System.out.println(str.hashCode());
		System.out.println(str.toLowerCase());
		System.out.println(str.toUpperCase());
	}
}
```

Design the program to counting space into string.

```java
package com.sample;

public class SampleTest {

	public static void main(String[] args) {

		String str = "velocity training center pune";

		int counter = 0;
		for (int i = 0; i < str.length(); i++) {

			char ch = str.charAt(i);
```

```
                if (ch == ' ') {
                    counter++;
                }
            }
            System.out.println("total space in string are>>" + counter);
        }
    }
```