

In this lab sheet, you will learn and practice how to use String, String buffer and String Builder class in JAVA. You are given a starter lab code in the course web. Download the project and continue in below exercises.

**Exercise 01 - Immutability of Strings (Compulsory)**

- I. Create a new String object str using the Following Methods. **(5 minutes)**
  - a. Using String Literal "Hello"
  - b. Using an Array of Characters {'H','e','l','l','o'}
  - c. Using another String object – String s = "Hello" and a String Literal
  
- II. Visit Java Docs and Check the String Class. ([String \(Java Platform SE 7 \) \(oracle.com\)](https://docs.oracle.com/javase/7/docs/api/java/lang/String.html)). Go to the concat() method ([String \(Java Platform SE 7 \) \(oracle.com\)](https://docs.oracle.com/javase/7/docs/api/java/lang/String.html#concat(java.lang.String))) and checkout the structure of concat() method. And try out the below exercise. **(20 Minutes)**
  - a. Use the String concat() method to concatenate str with " World" to generate "Hello World" and Print str.
  - b. Similarly check the replace() method([String \(Java Platform SE 7 \) \(oracle.com\)](https://docs.oracle.com/javase/7/docs/api/java/lang/String.html#replace(java.lang.CharSequence,java.lang.CharSequence))) and use replace method to replace 'H' with 'h' in str.
  - c. Did the Values Change?
  - d. If "No" explain why ? Think of how we can Fix it without using StringBuilder or StringBuffer?
  - e. If "Yes" explain why your values changed even though Strings are immutable.

**Exercise 02- StringBuilder Class (Mutable, Non-Synchronized) ( [StringBuilder \(Java Platform SE 7 \) \(oracle.com\)](https://docs.oracle.com/javase/7/docs/api/java/lang/StringBuilder.html)) (15 mins) (Compulsory)**

- I. Create a StringBuilder object with value "Hello ". Browse the Javadoc or use eclipse tooltip if you are not sure how to Create a StringBuilder Object.
- II. Append the String " World" to the StringBuilder object created in the above Question.
- III. Delete the word "Hello " from the StringBuilder object.
- IV. Insert "Hi"
- V. Use Replace Method to replace "Hi" With "Hello".

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**Exercise 03- StringBuffer Class (Mutable, Synchronized) (Compulsory) ([StringBuffer \(Java Platform SE 7 \) \(oracle.com\)](https://docs.oracle.com/javase/7/docs/api/java/lang/StringBuffer.html))**

- i. You are working on a program which requires you to be memory efficient. You are asked to develop several Methods(functions) to be used in the main program. **(20 mins)**.
  - a. You are given two arrays of First Names and Last names of users and you are required to generate and print the Full Names of all users separated by Commas.
  - b. There are different Errors that can be generated by the Program. When a List of Error codes are given you have to Generate and print the error message.
    - i. 400 - Bad Request
    - ii. 401 - Unauthorized
    - iii. 402 - Payment Required
    - iv. 403 - Forbidden
    - v. 404 - Not Found
    - vi. 405 - Method Not Allowed
- II. You are working on a program (shopping cart) and you are required to generate a log file to record the user Activities and display the log when the user exits the program. Modify the program given to you. **(15 mins)**
- III. Modify the above program such that users can input command itself (not the integer value) instead of the command code. You should handle the code regardless of the case (capital / simple/ Camel Case/ Mixed). In addition make sure you handle situations where input command is double-space, missing spaces or contains leading/trailing spaces. **(15 mins)**