**LAB SESSION 01**:

**STRUCTURAL PATTERNS**

**Date of the Session:** **/** **/** **Time of the Session: \_\_\_\_\_\_to**

**Pre-Lab:**

1. Write a Java Program to print “Hello ! world” using Singleton pattern

1. Consider a business case of fast-food restaurant where a typical meal could be a burger and a cold drink. Burger could be either a Veg Burger or Chicken Burger and will be packed by a wrapper. Cold drink could be either a coke or pepsi and will be packed in a bottle.

Draw a Builder pattern UML diagram for this case after listing the objects, classes , interfaces and methods needed for this use case.

**In-Lab:**

1. Implement the following scenario by **Bridge pattern** in Java :

Add the student names into the class register like “Ajay”, “Bala”, “Cathey”,”Chella”,”Dolly”, ”Ellan”, Francis”, ”Stella”.

Do the following operations on the class register

1. Display all student names
2. Delete “chella” from the register
3. Display previous and next names from the register.
4. Add “Zara” into the register
5. Display all student names after addition of “Zara”

1. Birthday : Interface that decribes methods to access the year, month, and day fields of a birthday, as well as a few methods to compare two Birthday instances.

BirthdayFactory : Abstract factory interface for the creation of Birthday instances.

BirthdayClient : Client class that gets uses a BirthdayFactory object to create and compare a few Birthday instances.

Your task is to make the GregorianCalendar Java library class usable as an implementation of the Birthday interface. Because GregorianCalendar cannot be modified, you will need to write an adapter class.

(a) Implement an object **adapter** DateObjectAdapter that adapts the given class GregorianCalendar to the new Birthday interface. Write a concrete factory class DateObjectAdapterFactory that implements BirthdayFactory.

(b) Similarly, implement a class adapter DateClassAdapter and a factory class DateClassAdapterFactory.

(c) Run the client class BirthdayClient.

1. Design a Criteria Design pattern for the following output:

Person : [ Name : Robert, Gender : Male, Marital Status : NotMarried ]

Person : [ Name : John, Gender : Male, Marital Status : Married ]

Person : [ Name : Mike, Gender : Male, Marital Status : NotMarried ]

Person : [ Name : Bobby, Gender : Male, Marital Status : NotMarried ]

Person : [ Name : Laura, Gender : Female, Marital Status : Married ]

Person : [ Name : Diana, Gender : Female, Marital Status : NotMarried ]

**Males:**

Person : [ Name : Robert, Gender : Male, Marital Status : NotMarried ]

Person : [ Name : John, Gender : Male, Marital Status : Married ]

Person : [ Name : Mike, Gender : Male, Marital Status : NotMarried ]

Person : [ Name : Bobby, Gender : Male, Marital Status : NotMarried ]

 **Females**:

Person : [ Name : Laura, Gender : Female, Marital Status : Married ]

Person : [ Name : Diana, Gender : Female, Marital Status : NotMarried ]

 **NotMarried:**

Person : [ Name : Robert, Gender : Male, Marital Status : NotMarried ]

Person : [ Name : Mike, Gender : Male, Marital Status : NotMarried ]

Person : [ Name : Bobby, Gender : Male, Marital Status : NotMarried ]

Person : [ Name : Diana, Gender : Female, Marital Status : NotMarried ]

 **Married:**

Person : [ Name : John, Gender : Male, Marital Status : Married ]

Person : [ Name : Laura, Gender : Female, Marital Status : Married ]

**Post-Lab:**

1. Build a home automation system where a programmable remote can be used to turn on and off various items in your home like lights, stereo, etc. Keep in mind that turning on some devices like stereo comprises of many steps like setting cd, volume etc. Implement this system by **command pattern**.

**Output:**

Light is on

Stereo is on

Stereo is set for CD input

Stereo volume set to 11

Stereo is off

**Reference links for each problem:**

**Pre Lab**

1. https://www.tutorialspoint.com/design\_pattern/design\_pattern\_quick\_guide.htm
2. https://www.tutorialspoint.com/design\_pattern/design\_pattern\_quick\_guide.htm

**In lab:**

1. https://www.javatpoint.com/bridge-pattern
2. Zip folder
3. https://ramj2ee.blogspot.com/2013/10/filter-or-criteria-design-pattern.html

**Postlab:**

1. https://www.geeksforgeeks.org/command-pattern/?ref=lbp