Object Oriented Programming Lab (JAVA)

BCSE 2 nd year 2 nd Semester

Assignment – 2

1. Design a **BankAcct** class with account number, balance and interest rate as attribute. Interest rate is same for all account. Support must be there to initialize, change and display the interest rate. Also supports are to be there to return balance and calculate interest.
2. Design a **Metric** class that supports Kilometre to Mile conversion with distance in Kilometre as argument and Mile to Kilometre conversion with distance in mile as argument. Assume, one Mile equals 1.5 Kilometre.
3. Take a String input that contains multiple words. Do the following: i) number of times 'a' appears ii) number of times "and" appears iii) whether it starts with "The" or not iv) put the String into an array of characters v) display the tokens in the String (tokens are the substrings separated by space or @ or .)
4. Consider a wrapper class for a numeric basic type. Check the support for the following: conversion from i) basic type to object ii) object to basic type iii) basic type to String iv) String (holding numeric data) to numeric object v) object to String.
5. Each customer of a bank has customer id, name, and current loan amount and phone number. One can change the attributes like name, phone number. A customer may ask for loan of certain amount. It is granted provided the sum of current loan amount and asked amount does not exceed credit limit (fixed amount for all customer). A customer may be a privileged amount. For such customers credit limit is higher. Once a loan is sanctioned necessary updates should be made. Any type of customer should be able to find his credit limit, current loan amount and amount of loan he can seek. Design and implement the classes.
6. For every person in an institute details like name, address (consists of premises number, street, city, pin and state), phone number, e-mail id are maintained. A person is either a student or a faculty. For student roll

number and course of study are also be maintained. For faculty employee id, department and specialisation are to be stored. One should be able to view the object details and set the attributes. For address, one may change it partially depending on the choice. Design and implement the classes.

7. Implement a multithreaded program in Java to solve the producer-consumer problem. Producer and Consumer are the two entities here who share the same buffer.

   The producer can either go to sleep or discard data if the buffer is full. The next time the consumer removes an item from the buffer, it notifies the producer, who starts to fill the buffer again. In the same way, the consumer can go to sleep if it finds the buffer to be empty. The next time the producer puts data into the buffer, it wakes up the sleeping consumer.

   An inadequate solution could result in a deadlock where both processes are waiting to be awakened.

8. Consider an employee has empcode (unique), empname, basic salary, grade, dept code. Develop GUI based application for the following:

   a) Develop GUI to accept data from user. For dept code, a list of dept names are to be shown from user chooses one and corresponding dept code will be part of employee object. Grade is either A or B or C. Once user selects SAVE button, get confirmation from user and if confirmed object is to be stored in file/collection class (as you like). Ensure empcode is unique. For duplicate value a message dialog is to be displayed and it will not be stored.

   b) Develop GUI that accepts an empcode from user. If SEARCH button is placed corresponding details are to be shown. If not found, display a message.