Object Oriented Programming

Assignment 1

Deadline 27th February 2022, 11:55 PM

Total: 25 points

Guidelines:

- Submission must include:
  - A doc file which contains all the codes in sequence of their questions.
  - Code files (.java) zipped in a folder. Each file should have name with student ID, Assignment and Question number. For example: "K211234-A1-Q1.java", "K211234-A1-Q2.java" format.
  - Output screenshots must be included for each question with name "K211234-A1-Q1-output.jpg", "K211234-A1-Q2-output.png" format. You can take screenshot by pressing windows + printscreen buttons. You can have multiple screenshots for a single question.
  - **Each output must contain your ID and name on the screen.**
- Plagiarism is punishable with zero grades in the task.
- Late submissions are not allowed.
- Submission link will be open from 25th till 27th Feb 2022. Details will be provided on google classroom.

Question 1.

Write a program that defines a vehicle class with (at least two types of) constructors that gives value to no_of_tyres and load_capacity. Must define destructors for the class. In the main, declare an object and then call the get_data () function to print two variables. **[5 Points]**

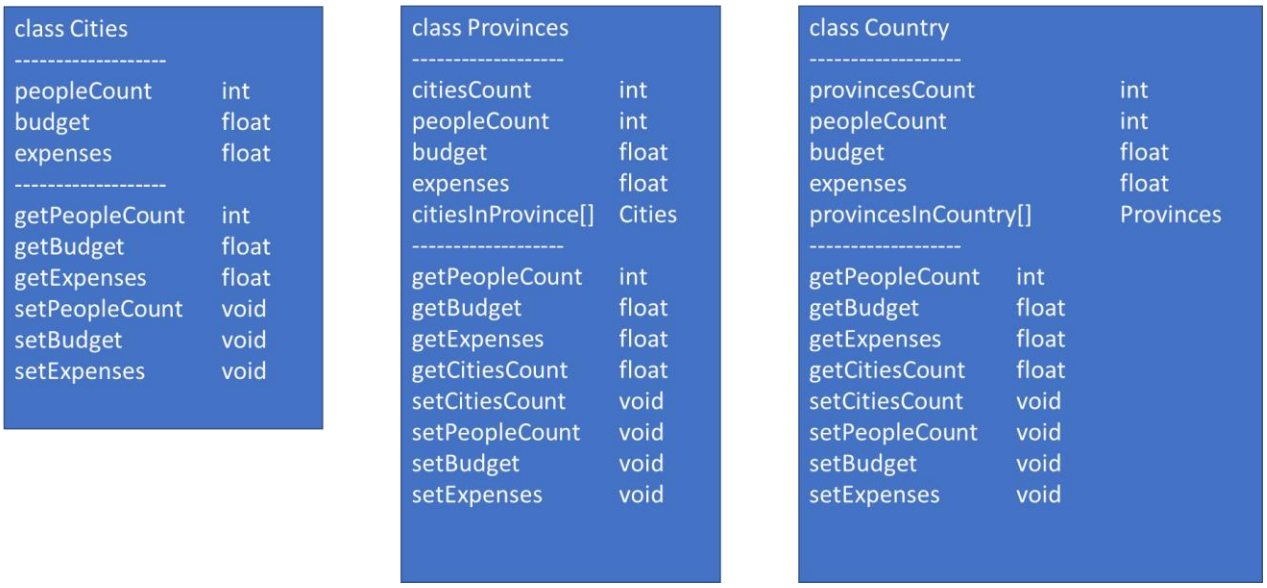
Question 2.

Write a program for a Phone directory system.

a. Create an appropriate class. **[1 Points]**
b. There should be a null and parameterized constructors for initial value and a destructor. **[2 Points]**
c. The class should have all members variable private. **[1 Points]**

d. Each member function should have setter and getter methods. Make the setter functions private and all the getters are public. **[2 Points]**
e. The main function should have following logics: **[4 Points]**
    i. Take last two digits of your ID (For example 34 from K21-1234). Create an array of that many object of phone entries.
    ii. Ask user to enter all the relevant data, using setter functions.
    iii. At the end of the program, show the output.
    iv. Create a copy of any one object using copy constructor.

Question 3.



A scenario is shown in given UML diagram. Review it to write program for each of the following tasks:

a. Create classes with defined member variables and functions. Each class must have default and parameterized constructors that assigns initial values to all members and destructors. **[2 Points]**
b. Write a main function where: **[3 Points]**
    v. Create one country “Pak” which should have five provinces.
    vi. One province has four cities.
    vii. Consider your ID as the total budget in millions for country “Pak”, for example ID is “k21-1234”, so 1234 million budget.
    viii. Divide that budget and assign equally to each province
    ix. From assigned budget, equally divide budget to the cities.

x. Print all details in a tabular form that shows all provinces and their members values. All cities and their member values.

c. Write a function totalExpenses() which asks people count for each city. If each person has a service cost of last two digits of your id (k21-1234 → 34) then calculate total expenses for each city. **[1 Point]**
d. Write a function totalExpenses2() which uses expenses values of cities and calculates total expenses of provinces and the country. **[1 Point]**
e. Write a function highestExpensesP() which prints details of the province with highest expenses. **[1 Point]**
f. Write a function finalFunction() which prints profit or loss using budget and expenses members for each province in a tabular form. **[2 Points]**