EASTERN INTERNATIONAL UNIVERSITY

SCHOOL OF COMPUTING

AND INFORMATION TECHNOLOGY

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Lab 4

Practice Assignment – **Quarter 2, 2023-2024**

Course Name: OOP

Course Code: CSE 203

Student's Full Name:
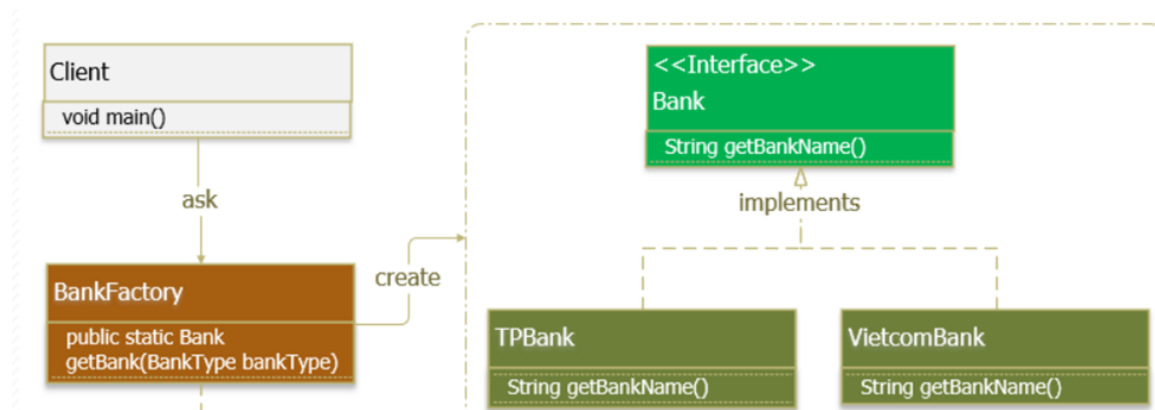
Student ID:

Question 1.   Collections

Use HashMap/TreeMap to write an English - Vietnamese dictionary program with about 10 words. Each word has 2 attributes: "word" and "meaning".

• Write a method to check if a word exists in the dictionary or not.

• Write a method to find the meaning of a word.

• Write the main method that requires the user to enter words to look up and then search, print

on the screen the meaning of the words you have requested.

Question 2.   Interface

All banking systems provide APIs to access their systems. The team is tasked with designing an API so that clients can use a bank's services. Currently, the client side only needs to use the services of two banks: VietcomBank and TPBank. However, for ease of future expansion, the client wants to not need to change their code when they need to use another bank's services. With such a requirement, we can use a Pattern called the Factory Method Pattern.

Class diagram:

Request:

• Install the getBankName() method of the TPBank and VietcomBank classes to return the strings "TPBANK" and "VIETCOMBANK"

• Install the main function to input the bank name to create the corresponding bank object and print the bank's name.

See also: https://casso.vn/api-ngan-hang/

Question 3. Polymorphism.

The university trains students in two systems: college system and university system. Information that needs to be commonly managed for all students includes: student number (String), student's full name (String), total number of credits earned (int), average score (double). In there

- College students, in addition to the above information, also have: graduation exam scores (double).
- University students, in addition to the above information, also have: thesis name (string) and thesis score (double).
- Graduation procedures are also different:
  - ➢ College students graduate when they have a total number of credits of 100 or more, an average score of 5 or more, and a graduation exam score of 5 or more.
  - ➢ Undergraduate students graduate when they have a total number of credits of 150 or more, an average score of 5 or more, and must defend their thesis with a score of 5 points or more.

Request:

- Use a single list to store all student information (Vector).
- Write the main menu function as follows:
1. Add a new college student.
2. Add a new university student.
3. Remove a student from the list with the student code entered from the keyboard.
4. Print student list.
5. Print the list of students eligible for graduation and indicate the number of eligible students.

6. Sort the student list ascending by Student type (College, university) and student code
7. Find student list by student's full name (Contains).
8. Exit

Submitted: github link (public) and all source code (*.rar file) submitted to moodle.