

CET2012 - Programming Paradigms: Advanced Java - Practicum 03

Topics Covered: Design Patterns

Learning Objectives:

- Familiarizing with various Design Patterns used in Java SE
- Refactor monolithic program codes

Deliverables:

- Submit a single zip file called `CET2012_P03_<Your_Name>.zip` (e.g. `CET2012_P03_John_Doe.zip`) containing your answers to the questions (in `PDF` format) and your code (the `src` folder).
- Note that a non-working submission will result in a zero

Important Information

There are 2 parts to this practicum: Questions being answered and Code Refactoring.

For the **Question** part, you will be answering the questions and documenting your results in a `PDF` file.

For the **Code Refactoring** part, you are given a small program upon which you are to refactor it based on the specified design pattern. Submit your refactored source folder of your IntelliJ project.

do not overwrite the original files, create your own files.
make sure you test the original files outputs first so that
you know what are the outputs you should be getting
after refactoring.

Question Part

You are to answer the following questions in a `PDF` format.

Given the following list of Java APIs, identify the design patterns used. Describe why the API follows the pattern you have identified. You are expected to refer to their respective documentations

- (a) Interface: `java.sql.PreparedStatement`
- (b) Package: `java.util.Arrays`, Method: `asList()`
- (c) Package: `java.lang.Runtime`, Method: `getRuntime()`
- (d) Package: `java.io.BufferedReader`, Methods: either of it's 2 constructors
- (e) Package: `java.util.logging.Logger`, Methods: `log()`

Code Refactoring Part

A small bank has decided to expand into more residential districts of the DigiWorld. Currently, it only has 2 branches in the districts *Dover* and *Bukit Timah* that services loans. Depending on the socioeconomic status of the residences in the districts, different types of loans and corresponding interest rates have been used by different bank branches.

In order to expand into the other residential districts, the bank requires you to refactor its current loan application portion of its system to allow for ease of future expansion. The bank has confirmed that the amortized formula used to calculate their *Optimum Repayment Amount* and *Total Interest* is correct. It is also noted that under the current system, the staff would need to know which loans are available from which branch. The bank would like the **new system to be able to tell** the staff that a specific loan is not available at the branch when they try to begin the process to apply for that particular loan.

The following table details the available loans for each branch.

Branch	Loans Available
Dover	Student & Home
Bukit Timah	Student, Home & Car

The current loan application portion is available from the `adv_java_pract_03_mono.zip`. Please create a new Java project in IntelliJ to do your refactoring.

For the maximum allocation of marks, refer to the table below.

Description	Marks (%)
Each correct answer in each part of the question will be awarded 7 marks. - 3 marks for correct identification of design pattern - 4 marks for correct explanation	35
Correct implementation of the Factory Design Pattern for the Code Refactoring Portion includes proper code organization need to put in packages	55
Proper and generable documentation using Javadoc tool	10

Once you have completed, save your file in the following format `CET2012_P03_<Your_Name>.zip` e.g. `CET2012_P03_JohnDoe.zip`.