

A4 (30 marks)

Focus: relational and logical operators, selection using if and switch,

Q1. [7 marks] Write code that takes a letter as input, and then checks whether the letter is a vowel (i.e., one of a, e, i, o, u) or a consonant. If the letter is not a valid alphabet character, print an error message stating so.

Sample run:

```
Enter a letter: a
a is a vowel
```

```
Enter a letter: h
h is a consonant
```

```
Enter a letter: $
$ is an invalid input
```

Q2. [7 marks] Assume vehicle plate numbers use the following standard: XB-23 (any two letters followed by any two digits). Develop a program that reads a plate number provided by the user, and then validates the plate number by:

- Ensuring it has **exactly** five characters
- It starts with two uppercase letters, followed by a dash, and finally two digits.

Print a message stating whether the plate number is valid or not.

Sample run:

```
Enter a valid plate number: aBC-23
aBC-23 is an invalid plate number
```

```
Enter a valid plate number: AW-29
AW-29 is a valid plate number
```

Q3. [8 marks] Compose a program that validates the perimeter of a triangle. The program should receive (from the user) the length of each of the three sides of a triangle as a double value. Then, the values should be validated using the following criterion:

- The length of all sides have a positive value
- The sum of **any** two (out of three) sides should be greater than the remaining side.

Sample run:

```
Enter three edges (length in double): 3 4 9
Input is invalid
```

```
Enter three edges (length in double): -2 3 4
Input is invalid
```

```
Enter three edges (length in double): 2 3 4
The perimeter is 9.0
```

Q4. [8 marks] Write a program that plays the popular scissor-paper-rock game. (A scissor can cut a paper, a rock can knock a scissor, and a paper can wrap a rock.) The program randomly generates a number 0, 1, or 2 representing scissor, rock, and paper. The program prompts the user to enter a number 0, 1, or 2 and displays a message indicating whether the user or the computer wins, loses, or draws.

Sample run:

```
scissor (0), rock (1), paper (2): 0
The computer is paper. You are scissor. You won
```

Submission Instructions

For this assignment, you need to do the following:

- 1- Create a Java project of which name consists of **your student number followed by the assignment number**, e.g., "1234567_A1".
- 2- Create one class for each question and write your answer inside that class. Your classes should have the same name as the question number (e.g., Q1)
- 3- After solving all questions, open Windows Explorer (or any other file explorer).
- 4- Navigate to your Java project folder (can be found inside your Eclipse workspace folder).
- 5- Locate the "src" folder for this project (the folder that includes the source code for all questions).
- 6- Zip the "src" folder and rename the zipped file to match your project name (e.g., 1234567_A1.zip).
- 7- Submit the zipped file **to Canvas**.

Note that you can resubmit an assignment, but the new submission overwrites the old submission and receives a new timestamp.