FIT1051 Assessment One

Submission deadline: Thursday 21st March 11:55pm AEST (11:55pm MYT) via Moodle

Weight: 12% of your overall unit mark

Late Penalty: 10% mark deduction per day

Instructions: Below are the coding tasks that you need to complete for Assessment 1. Your work and your submission should be independent. Please download the IntelliJ project folder below and unzip it. This will provide you with partial code in which to program your answers. Please complete each task in the appropriate section of the partial code, and submit to Moodle upon completion.

This assessment is worth 12% of the unit total. Submission of your code is worth 40% of this total, and your interview component (held later in Week 5) is worth 60%.

The programming portion of this assessment contains 48 marks and is comprised of the following components:

Code correctness is worth 40 marks:

- Task 1 is worth 6 marks
- Task 2 is worth 12 marks
- Task 3 is worth 8 marks
- Task 4 is worth 14 marks

Writing good quality code that adheres to the FIT1051 Coding Standards is worth 8 marks.

Academic Integrity: Please be reminded of the academic integrity standards that are expected of you at Monash, which were mentioned in Week 1. You should code alone and ask the unit staff for help if needed. Do not post your code in public forums or send your code to anyone. Do not copy/paste code from other sources and present it as your own — this includes use of generative AI tools. Breaching these academic integrity requirements can incur serious penalties.

Task 1: Simple Methods (W2 - 6 marks)

(a) (4 marks) In the Assessment1 class project, code a new method called areaOfCircle that takes one parameter of type double called r, which represents the radius of a circle. The method should return (not print) the area of the circle. This should be calculated using the formula:

$$area = \pi * r^2$$

Carefully consider the return type of the final value.

Hint: You will need to use Math.PI from the Java Math library.

(b) (2 marks) Then, inside the method labelled task1(), write code that calls the areaOfCircle method with parameter r=5.0 and prints the result.

Task 2: Defining Classes (W2 - 12 marks)

(a) (9 marks) In the provided file Monster.java, create a new Monster class with four different fields, representing the following attributes:

- the monster's name
- the monster's attack value (0 - 10)
- the monster's defence value (0 - 10)
- the monsters health value (0 - 100)

Choose appropriate data types to represent each of these fields.

Now, create the following methods for the Monster class:

- a default constructor, which assigns sensible default values to each attribute,
- a non-default constructor which takes four parameters defining the four attribute values,
- getter and setter methods for each of the attributes.

(b) (3 marks) Once you have created this class, in the Assessment1 class under the task2() method, write code that:

- instantiates a Monster object called monster1 with the name "Mattasaur", attack 8, defence 3 and health 60.
- changes monster1's health to 45 using an appropriate method;
- retrieves and prints monster1's new health using appropriate methods.

Task 3: Selection (W3 - 8 marks)

(a) (4 marks) Methods can be created to do generic data validation. Write a method called numberValidator that:

- Accepts three integers: numToCheck, min and max
- Returns the boolean true if numToCheck is within the min and max range, or false if it is not

Your code should use one of the selection constructs you have learned about in Week 3.

(b) (4 marks) Then, inside the method labelled task3(), write code that

- Prompts the user to enter an integer
- Once the number is entered, calls the numberValidator method using the entered number, min = 0 and max = 100
- The user is told if the number is valid

Example behaviour:

```
> Please enter an integer:

75

> The number is valid.
```

Task 4: Selection (W3 - 14 marks)

(a) (9 marks) Write a method called dateValidator that:

- Accepts three integers: day, month, year
- Returns the boolean true if it is a valid date, or false if it is not. Don't forget leap years!

Your code should use one of the selection constructs you have learned about in Week 3.

(b) (5 marks) Then, inside the method labelled task4(), write code that

- Prompts the user to enter the day, month and year
- Once the numbers are entered, calls the dateValidator method using the entered numbers
- The user is told if the date is valid

Example behaviour:

```
> Please enter a day, month and year:

29 2 2024

> The date is valid.
```

Adherence to coding standards (8 marks)

All code written should adhere to the guidelines set out in the FIT1051 Coding Standards.

Submission Instructions: Please submit your IntelliJ project folder as a .zip file and submit to the Assessment 1 link on the Moodle Assessments page as shown below. If you are not sure how to zip your project, please refer to the video here. MAKE SURE YOU DOWNLOAD FROM MOODLE AFTER THAT TO CHECK IT IS THE RIGHT SUBMISSION!

Interview component: You will be asked to demonstrate your program at an interview in Week 5, following the code submission date. You will need to book an interview time with your tutor during your Applied Session in Week 4.

The interview will be 10 minutes in length, and consist of 6 questions. You may be asked to explain your code, your program designs, to modify your code, to discuss your coding decisions, or to explain the any of the coding concepts taught in Weeks 1-4 that this Assessment covers.

Interviews will take place in person during Applied class time, and also online via Zoom. You must have access to a stable internet connection and a working webcam, and your webcam must be switched on for the duration of the interview. Interviews will be recorded for marking integrity purposes, and recordings will be deleted at the end of semester.

It is your responsibility to make yourself available for an interview time. The interview is worth 60% of your assessment mark, and any student who does not attend an interview will receive a fail grade for the assignment. Your interview must take place before the end of Week 5.