BACS2023 Object-Oriented Programming
Practical #4B

Question 1

A. (***Using the* this *keyword***) Modify the **Student** class from Practical #4A's Question 2 based on the following:
   - In the parameterized constructor and set methods, the parameters have the same name as the corresponding data field.
   - The no-arg constructor will invoke the parameterized constructor

B. (***Using static variables and methods***) Suppose your tutor wants the contribution of quizzes to the coursework mark be stored in the Student class and this value may be revised in other semesters. Modify the Student class accordingly.

C. Modify the driver program in Practical #4A's Question 2 to include the following:
   - Set a value of 20% for the contribution of quizzes to the coursework mark
   - Calculate and display the quiz marks (out of 20 marks) obtained by each student

Question 2

The Road Transport Department needs to keep track of car registrations. For every car registered, the following information will be stored:

- Registration number
- Owner's name
- Owner's IC number
- The car's plate number
- Brand
- Model
- Engine capacity (e.g., 1.8L, 2.0L)
- Color
- Year manufactured

[**Note**: the required information to be stored has been greatly simplified to make it manageable as a practical exercise].

Identify the required classes and appropriate relationships (aggregation or composition) between the classes. Implement all the classes and then write a driver program that will obtain input details from the user on the cars registered. Then, produce a listing containing the details of the car registrations. A sample listing is provided in the next page.

Note: As the focus of this question is the implementation of ***composition*** and ***aggregation***, you may simplify your solution as follows:

A. Use the **String** type for the owner's name.
B. For the entity classes, you only need to implement the following:
   - A parameterized constructor to initialize all the instance variables.
   - The **toString** method to return all the data fields' values as a string.
   - Automate the registration number.

C. In your driver program,

- You may create an array of car type objects where each object stores the information of a car type. This array may be created using the ***array initializer***. Then, during user input for a car registration, you may display the various car types for the user to select from.
- Use a fixed for-loop to input several registration data.
- Assume that other than the owner's name, the other string-typed data will only consist of a single word.
- Input validations are not needed.

A sample listing:

Car Registration Listing								
Reg #	Name	IC #	Plate #	Color	Year	Brand	Model	Capacity
1001	John Wayne	111111111	ABC123	Blue	2010	Toyota	Vios	1.5
1002	Bea Arthur	222222222	WEA888	Red	2010	Nissan	Teana	2.0
1003	Meg Ryan	333333333	PBL168	Black	2011	Honda	City	1.6
1004	Jane Doe	444444444	BBB777	White	2011	Nissan	Teana	2.0
1005	Al Johnson	555555555	CAT118	Green	2012	Toyota	Vios	1.5
1006	Ned Beatty	666666666	TV798	Blue	2012	Toyota	Vios	1.5

Question 3

a) Briefly explain the usage of static keywords in Java programming
b) Provide an example of the data can be declared as static variable.