

## Lab Sheet 07

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### Instructions

- Create a folder in the desktop (i.e. UWU\_CST\_21XXX) to save your source code files.
  - Zip the main folder and upload it to the given link in the VLE course page each week.
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1. Write a Java program to check whether a number is positive, negative or equal to zero using functions.
2. Write a Java program to check whether a number is even or odd using functions.
3. Write a Java program to find diameter, circumference and area of a circle using functions.
4. Write a recursive Java function to find the sum of the digits of a positive integer.
5. Write a recursive Java function to find the sum of the elements in an array of integers.
6. Create a class representing a Person with private fields for name, age, and email. Implement public getter and setter methods for each field to encapsulate their access.
7. Develop an Employee class with private fields for name, id, and salary. Implement methods to set a salary amount and retrieve employee information.
8. Create a Student class with private fields for name, enrollNumber, and course. Write methods to enroll a student in a course and retrieve their details.
9. Create a User class with private fields for username and password. Initialize values for username and password fields. Implement methods to authenticate a user by checking their credentials.
10. Create a parent class Vehicle with attributes like manufacturer, year, colour and methods like *startEngine()* and *stopEngine()*. Derive classes like Car, Lorry and Motorcycle from Vehicle with specific additional attributes and methods.

11. Design a base class Product with attributes like name, price, and methods like getDescription(). Create subclasses like Electronics, Clothing, and Books that inherit from Product with specific additional attributes and methods.
12. Define a base class Employee with attributes like name, employee\_id, rate\_per\_hour and methods like calculateSalary(). Extend the class to create subclasses like Manager, TechnicalOfficer and Developer. Assign different salary calculation rates for the rate\_per\_hour attribute in each class and calculate the salaries for each employee using the inherited calculateSalary() method.