National University of Computer and Emerging Sciences

Assignment No. 1

Programming Fundamentals

CS1002

Fall 2022

Deadline: 16-09-2022, 04:00PM

Department of Computer Science

Submission Instructions:

- All problems must be solved by following the order and submitted in hand-written format.
- Printed assignment will get you zero marks.
- This is an individual assignment.
- **Plagiarism is strictly prohibited.**

Assignment Tasks

1. Write down pseudocode and draw flowchart of a program that converts kilometers per hour to miles per hour.
   Hint: 1km = 0.621371 miles
2. Write down pseudocode and draw flowchart that reads in the radius of a circle and prints the circle's diameter, circumference, and area. Do all calculations in output statements.
3. Design pseudocode to check whether the given number is buzz number or not.
   Hint: A number is said to be Buzz Number if it ends with 7 OR is divisible by 7.
4. Design pseudocode that reads in five integers and determines and prints the largest and the smallest integers in the group using **nested if**.
5. Design pseudocode and draw flowchart for the following task:
   Create a BMI calculator application that reads the user's weight in kilograms and height in meters, then calculates and displays the user's body mass index by using formula:

   BMI = weight in kilograms / height in meters * height in meters

   Also, the application should display the person **health condition** by evaluating the following conditions.

BMI VALUES
Underweight: less than 18.5
Normal: between 18.5 and 24.9
Overweight: between 25 and 29.9
Obese: 30 or greater

6. Draw flowchart for the following pseudocode:
   1. Set total and average to zero
   2. Set grade counter to one
   3. While grade counter is less than or equal to ten
      3.1. Ask the student to input the next grade
      3.2. Add the grade into the total
      3.3. Add one to the grade counter

4. Set the class average to the total divided by ten
5. Print the total of the grades for all students in the class
6. Print the class average

7. Write pseudocode for an application that calculates your daily driving cost, so that you can estimate how much money could be saved by carpooling, which also has other advantages such as reducing carbon emissions and reducing traffic congestion. The application should input the following information and display the user's cost per day of driving to work:

a) Total miles driven per day.

b) Cost per gallon of gasoline.

c) Average miles per gallon.

d) Parking fees per day.

e) Tolls per day.

8. Jason typically uses the Internet to buy various items. If the total cost of the items ordered, at one time, is $200 or more, then the shipping and handling is free; otherwise, the shipping and handling is $10 per item. Design pseudocode and flowchart that ask Jason to enter the number of items ordered and the price of each item. Display the total billing amount. Use a loop (repetition structure) to get the price of each item. (For simplicity, you may assume that Jason orders no more than five items at a time.)

9. Design pseudocode and flowchart for a program that calculates the squares and cubes of the integers from 0 to 10.

10. Write pseudocode to check whether the triangle is equilateral, isosceles, or scalene triangle.

Hint: In equilateral triangle, all the three sides are equal.

In isosceles triangle, any of the two sides are equal.

In scalene triangle, all the three sides are unequal.