CSY1019 Week 3

Lab Exercises:

1. Consider the following declarations in Java:
   ```
   int num1 = 12, num2 = 4, num3 = 14 , num4 = 6;
   double val1 = 3.0;
   ```
   What value is stored in each of the listed assignment statements below?
   Compute by hand and then verify results using eclipse.

   (i)   `double result1 = 2 + num1 / num2;`

   _____

   (ii)   `int result2 = (num4 +1) % num2;`

   _____

   (iii)   `int result3 = 5 + (int) (3 + val1 / 2);`

   _____

   (iv)   `double result4  =  (double)(13/(num4 -4));`

   _____

   (v)   `double result5 =  ((double) (num3+1) / 2);`

   _____

2. Assume that `int x = 2, y = 5` and `double z = 7.3,` and that each
   expression is **independent**. What are the results of the following expressions in
   Java? Compute by hand and then verify results using eclipse.

   (i)   `x = 8 - ++y;`

   _____

   (ii) `y = (x++) + 3;`

   _____

   (iii) `z = 2 * (++y) + (int) (z);`

```
_____

(iv)  y = 2 * (++x) + (y++) + x++;


_____
```

Programs:

1. Write a program that reads a number in centimeters, converts it to inches, and displays the result on the console. One centimeter is 0.3937 inches.
   Sample Run:
   Enter centimeters as an integer: 5
   The value in inches is 1.9685

2. Write a program that accepts a temperature (as double) in Farenheit from a user in the console and converts it to Celsius by subtracting 32 from the Farenheit value and multiplying the result by 5/9. Display both values on the console.
   Sample Run:
   Enter a temperature in Farenheit: 72.0
   72.0 in Farenheit is 22.222222 Celsius

3. Write a program that reads in the radius of a circle from the console and calculates the area of a circle. Area of a circle = PI * r * r. Display output on the console. (Use mathematical constant PI from Math Class)

4. Write a program that reads two integer values from a user and stores them in two variables. The program should then exchange (or swap) the values in the two variables and display the values.

5. Write a program that prompts for the number of pizzas and the number of toppings. The program should calculate the price of the pizza (including sales tax) and print a receipt. Pizzas are £12.00 each. Each additional topping is £1.50. Tax is 5 percent.

   Sample Run:
   Enter the number of pizzas: 4
   Enter the total number of toppings: 6

Receipt:
Number of Pizzas: 4
Number of Toppings: 6
Cost (incl. tax): £59.85

6. Ask the user to pick a secret number between 1 and 1000. Now, instruct the user to divide the secret number by 7 and report the remainder. Then tell him/her to do the same with 11 and finally 13. You can discover the user's secret number with the following algorithm:
   1. Multiply the first remainder by the magic multiplier 715.
   2. Multiply the second remainder by the magic multiplier 364.
   3. Multiply the third remainder by the magic multiplier 924.
   4. Add the three products.
   5. The secret number is the remainder when the sum is divided by 1001.

   Write a program that allows the computer to play the role of math-magician by using the above algorithm. The program should prompt the user for the appropriate remainders and display the player's secret number.

   Sample Run:
   Think of a number between 1 and 1000
   Divide by 7 and tell me the remainder: 2
   Divide by 11 and tell me the remainder: 1
   Divide by 13 and tell me the remainder: 10
   Your secret number is: 23