

CS101- Algorithms and Programming I

Lab 01

Lab Objectives: Input and output, formatted output.

For all labs in CS 101, your solutions must conform to the CS101 style guidelines (rules!)

1. Create a folder, Lab01. In your Lab01 folder write a Java program, Lab01_Q1.java, that inputs a value , x, from the user (shown in blue) and calculates and displays the value of y according to the given function.

$$y = \frac{x^3 + 3|x| + 9}{x^2}$$

Sample Run 1:

```
Enter x: 7
y = 8
7.61 is between 7 and 8
```

Sample Run 2:

```
Enter x: -5
y = -4
-4.04 is between -5 and -4
```

2. Create a folder, Lab01. In your Lab01 folder write a Java program, Lab01_Q2.java, that inputs a date and time as shown, and outputs as formatted below.

Sample Run:

```
Enter date and time: 08:10/Saturday-April-01,2023
10 minutes past 08 on 01 April 2023 (Saturday)
```

3. In your Lab01 folder, write a Java program, Lab01_Q3.java that is used to calculate the daily nutritional requirements for weight loss for a user.
 - o Your program should input the number of kilograms the user would like to lose, and the goal number of days to lose the desired weight.
 - o You may assume that the daily calorie requirement to maintain weight is 2000 calories, and to lose 1 kilogram, requires a calorie deficit of 7700.
 - o You should define all know values as constants and all data and calculations should be stored in appropriately named variables.
 - o The recommended percent of each macro and calories per gram in each macro are given in the sample run. You may assume these are constant values.
 - o Your program should calculate the recommended calories and number of grams per day for each macro according to the kilograms and number of days entered by the user.
 - o Output should be formatted as in the sample run.

Sample Run 1:

```
Enter kilograms to lose: 2
Enter days to lose 2 kilograms: 40
*****
To lose 2 kilograms in 40 days you will need a daily deficit of 385 calories
*****
RECOMMENDED DAILY CALORIES TO LOSE 2 KILOS IN 40 DAYS: 1615
*****
MACRO                RECOMMENDED PERCENT    CALORIES PER GRAM    RECOMMENDED CALORIES    GRAMS
CARBOHYDRATE          50%                      4                   808                   201.9
FAT                    30%                      9                   485                    53.8
PROTEIN                20%                      4                   323                    80.8
*****
```

Sample Run 2:

Enter kilograms to lose: 1

Enter days to lose 1 kilograms: 7

To lose 1 kilograms in 7 days you will need a daily deficit of 1100 calories

RECOMMENDED DAILY CALORIES TO LOSE 1 KILOS IN 7 DAYS: 900

MACRO	RECOMMENDED PERCENT	CALORIES PER GRAM	RECOMMENDED CALORIES	GRAMS
CARBOHYDRATE	50%	4	450	112.5
FAT	30%	9	270	30.0
PROTEIN	20%	4	180	45.0
