



EASTERN UNIVERSITY, SRI LANKA

DEPARTMENT OF MATHEMATICS

FIRST YEAR EXAMINATION IN SCIENCE-2014/2015

FIRST SEMESTER (AUG. / SEP. , 2016)

**CS 152 - PRACTICAL WORK ON INTRODUCTION TO PROGRAM DESIGN AND
PROGRAMMING**

PROPER & REPEAT

Answer all questions

Time allowed: 2 Hours

Note : Save your files with the question number and your index number.

Eg: Q1_1138

1. One way to determine how healthy a person is by measuring the body fat of the person. The formulas to determine the body fat for female and male are as follows:

Body fat formula for female:

$$A1 = (\text{body_weight} \times 0.732) + 8.987$$

$$A2 = \text{wrist_measurement} / 3.140$$

$$A3 = \text{waist_measurement} \times 0.157$$

$$A4 = \text{hip_measurement} \times 0.249$$

$$A5 = \text{forearm_measurement} \times 0.434$$

$$B = A1 + A2 - A3 - A4 + A5$$

$$\text{Body_fat} = \text{body_weight} - B$$

$$\text{Body_fat_percentage} = \text{body_fat} \times 100 / \text{body_weight}$$

Body fat formula for male:

$$A1 = (\text{body_weight} \times 1.082) + 94.42$$

$$A2 = \text{wrist_measurement} \times 4.15$$

$$B = A1 - A2$$

$$\text{Body_fat} = \text{body_weight} - B$$

$$\text{Body_fat_percentage} = \text{body_fat} \times 100 / \text{body_weight}$$

Write a program to prompt the user to enter the following values:

- I. the person is male or female,
- II. the weight of the person,
- III. the measurements of wrist, waist, hip, and forearm for female & ,
- IV. the measurement of wrist for male.

Using above values calculate the body fat of a person.

2. Define a **struct**, **menuItem**, with two components: **menuItem** of type string and **menuPrice** of type double. Write a program to a local restaurant for its breakfast bill system. The program should do the following:
- Get the menu item and the price details from the restaurant staff.
 - Show the customer the different breakfast items offered by the restaurant.
 - Allow the customer to order the number of each item from the menu.
 - Calculate the amount and print the bill.

Assume that the restaurant offers the following breakfast items (the price of each item shown to the right of the item):

Egg Bun	Rs 27.50
Sausage Bun	Rs 30.00
Sandwich	Rs 34.75
Bread Toast	Rs 32.50
Drumstick	Rs 40.25
Pastry	Rs 25.00
Coffee	Rs 15.15
Tea	Rs 17.75

Your program must contain the following functions:

- Function `getData`: This function collect the different items and its price offered by the restaurant.
- Function `showMenu`: This function shows the different items offered by the restaurant
- Function `itemOrder`: This function tells the user to select the number of each item.
- Function `printCheck`: This function calculates and prints the check.
(Note that the billing amount should include a 5% service charge from total)

A sample output is:

Welcome to Shiney Restaurant

Egg Bun	×1	Rs 27.50
Sausage Bun	×1	Rs 30.00
Sandwich	×0	Rs 0.00
Bread Toast	×2	Rs 65.00
Drumstick	×3	Rs 120.75
Pastry	×0	Rs 0.00
Coffee	×2	Rs 30.30
Tea	×0	Rs 0.00
Total		Rs 521.05
Service Charge	5%	Rs 26.05
Amount Due		Rs 547.10

Format your output with two decimal places. The name of each item in the output must be left justified.