

# UNIVERSITI TEKNOLOGI MALAYSIA

## FACULTY OF COMPUTING

### SKILL-BASED TEST 1

### SEMESTER I 2017/2018

**SUBJECT CODE : SCSJ1023**  
**SUBJECT NAME : PROGRAMMING TECHNIQUE II**  
**YEAR/COURSE : 1 (SCSJ / SCSR / SCSV)**  
**TIME : 2 p.m. – 3 p.m. (1 Hour)**  
**DATE : 12 OCTOBER 2017**  
**VENUE : MPK8, N28**

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#### INSTRUCTIONS TO THE STUDENTS:

- This test consists of only **ONE** question.
- This is a **CLOSED-BOOK** test. References to any resources by any means are strictly prohibited.
- You are given **ONE HOUR** to complete the test inclusive the submission of your program.

#### MATERIAL FOR THE TEST:

- You are provided a program source code file named **sbt1.cpp** which you want to use it as the base to answer this test.

#### SUBMISSION PROCEDURE:

- Only the source code is required for the submission.
- Submit the source code file (i.e., sbt1.cpp) via the **UTM's e-learning system**.

## Problem

[45 Marks]

A box can be represented by its dimensions, *width*, *length* and *height*. Then, the volume of the box is calculated by multiplying the dimensions, i.e.,  $volume = width \times length \times height$ . Complete the source code file, `sbt1.cpp`, according to the following tasks:

1. Define a class named `Box` which consists of
  - a. all the required attributes representing the dimensions, (3 marks)
  - b. constructors (or a constructor with default arguments), (4 marks)
  - c. mutators, (6 marks)
  - d. accessors, and (6 marks)
  - e. a method that calculates the volume. (3 marks)
2. Complete the definition of function `printBox`. This function prints the dimensions and volume of a box. (4 marks)
3. Create an array to hold 5 boxes and initialize the first and second boxes with specified dimensions. (4 marks)
4. Using a loop, set the dimensions the remaining boxes with values entered from the keyboard. (7 marks)
5. Using the function `printBox` and another loop, print all the boxes. (3 marks)
6. Calculate and print the total volume of all boxes. (5 marks)

The following figure shows what your program should look like when it runs. Note that, the **bold** texts indicate keyboard input entered by the user.

```
Enter box dimensions (w l h) => 2 3 4
Enter box dimensions (w l h) => 10 5 20
Enter box dimensions (w l h) => 3 3 3

Dimension = 10 x 10 x 10
Volume    = 1000

Dimension = 20 x 20 x 20
Volume    = 8000

Dimension = 2 x 3 x 4
Volume    = 24

Dimension = 10 x 5 x 20
Volume    = 1000

Dimension = 3 x 3 x 3
Volume    = 27

Total volume = 10051
```