

# UNIVERSITI TEKNOLOGI MALAYSIA

## FACULTY OF COMPUTING

### SKILL-BASED TEST 2

**SEMESTER I 2016/2017**

**SUBJECT CODE : SCSJ1013**  
**SUBJECT NAME : PROGRAMMING TECHNIQUE I**  
**YEAR/COURSE : 1 (SCSJ / SCSV / SCSB / SCSR)**  
**TIME : 2:30 pm – 3:30 pm.**  
**DATE : 6 DECEMBER 2016**  
**VENUE : N28 MPK1-MPK8**

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#### **INSTRUCTIONS TO THE STUDENTS:**

- This test consists of only **ONE** question
- 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 **sbt2.cpp** which you want to use it as the base to answer this test, and two samples of input files, **input1.txt**, and **input2.txt**. All these files are compressed into a RAR file.
- Download the RAR file from the UTM's elearning to your computer's hard drive.
- **IMPORTANT NOTES:** Do not edit the source code file directly from the RAR file. You must extract them into your local hard drive.

#### **SUBMISSION PROCEDURE:**

- Only the source code (*i.e.* the edited **sbt2.cpp**) is required for the submission.
- Submit the source code via the **UTM's e-learning system**.

## **Problem**

**[35 Marks]**

The program given in the source code file **sbt2.cpp** is meant to calculate the Cumulative Grade Point Average (CGPA) and generate the result transcript for a college student. The program will request the user to enter an input file containing the list of subjects taken by the student along with the credit hour and grade earned for each subject. The program will generate the result transcript which shows the subjects, total number of credit hours, total number of credit points and the CGPA. The function to read the input file named **readFile** has been provided in the source code file. Edit the source code file, **sbt2 . cpp**, according to the following tasks:

- Task 1: Complete the definition of function **gradeToPoint**. This function determines the point value for a letter grade. Refer to the following table for the conversion.

Grade	Point
A	4.0
B	3.0
C	2.0
D	1.0
E	0.0

**(5 marks)**

- Task 2: Complete the definition of function **readFile**. This function reads inputs from a file consisting of the list of subjects along with their credit hours and grades earned by the student. The read data are then stored in arrays accordingly.

**(5 marks)**

- Task 3: Complete the definition of function **sum**. This function calculates the sum of elements of an array. **(4 marks)**

- Task 4: Complete the definition of function **multiply** which multiplies the elements of two arrays correspondingly, and puts the result into another array. **(2 marks)**

- Task 5: Read inputs, i.e., a list of subjects, from an input file. **(2 marks)**

Task 6: Using appropriate functions defined above, calculate the total credit hours, total credit points and CGPA.. **(8 marks)**

Task 7: Print the list of subjects along with their credit hours, grades earned and grade points. **(5 marks)**

Task 8: Print the number of subjects, total credit hours, total credit points and CGPA. **(4 marks)**

The following figures show example runs of the program with different input files. Note that the bold texts indicate input from the user.

#### ***Example run 1***

```
Enter the input file => input1.txt

Subject Name          Credit Hour    Grade Earned   Grade Point
Computer Programming      3            C              2
Network Programming       4            A              4
Database Programming      4            B              3
Interface Design          2            B              3
Software Engineering      3            A              4

Number of subject : 5
Total credit hours : 16
Total credit points : 52
CGPA               : 3.25
```

#### ***Example run 2***

```
Enter the input file => input2.txt

Subject Name          Credit Hour    Grade Earned   Grade Point
Soil Science           3            B              3
Architecture          4            B              3
Interior Design        4            A              4

Number of subject : 3
Total credit hours : 11
Total credit points : 37
CGPA               : 3.36
```