

**UNIVERSITI TEKNOLOGI MALAYSIA
FACULTY OF COMPUTING**

FINAL EXAM : PAPER II

SEMESTER I 2014/2015

SUBJECT CODE : SCSJ1013
SUBJECT NAME : PROGRAMMING TECHNIQUE I
YEAR/COURSE : 1 (SCJ / SCV / SCB / SCR)
TIME : 2:30 p.m. – 5:30 p.m. (3 Hours)
DATE : 4 JANUARY 2015
VENUE : N28 MPK1-MPK10

RULES AND REGULATIONS:

- This is an open book examination. However, you are only allowed to bring ONE printed copy of any text or reference book.
- You are strictly prohibited from getting helps from others by any means such as discussions with your peers, communicating via email, facebook, twitter, forum, etc.
- Plagiarism by any means is strictly prohibited. If your program is suspected to be similar with someone else, yours and the other parties will automatically be disqualified.

INSTRUCTIONS TO THE STUDENTS:

- Read the instructions and question carefully.
- Use the tool Dev C++ for writing your program.
- The duration given for completing this examination is inclusive of the submission of your program.
- Your program must follow the input and output as required in the text and shown in the examples. You must test the programs with (but not limited to) all the input given in the examples.

SUBMISSION PROCEDURE:

- Only the source code (i.e. the file with the extension **.cpp**) and header files (if any) are required for the submission.
- Create a compressed file (e.g., in a **.rar** file) if your program consists of more than a file.
- Submit your work online via UTM's elearning system.

Problem

Company XYZ is a large supermarket chain that has numerous branches all across Malaysia. The number of branches keeps increasing each year as the company performs well in delivering cheap quality goods to customers.

Write a program to analyze the profit earned by the company. Your program should comply with the following requirements.

Input Files:

The company stores its sales records of all of its branches in a text file for each financial year. Fields in the file are separated by tabular spaces. **Figure 1** shows an outline of the content of a file.

1998						
branch_id	jan_cost	jan_sales	feb_cost	.....	dec_cost	dec_sales
A1234	51000	73000	62000	.....	52000	71000
A1237	63000	82000	78000	.....	73000	84000
B1240	99000	102000	97000	.....	82000	95000
...						
Z1200	59000	58100	.....	62050	86300	

Figure 1

The details of file format are as follow:

- The first line is the financial year.
- The second line indicates a line of comment describing the names of columns or fields.
- The third line onwards is the sales and cost data for each branch where the first field represents the identifier number for the branch and the remaining fields are the sales and cost data for each month.

Notes: you are provided with some samples of input files to test your program.

Output Files:

Your program should print the following information into an output file:

- a. **The total profit for each branch for the year** which is calculated as the sum of profit of each month for a particular branch. Note that a profit is obtained by:

$$\textbf{Profit} = \textbf{Sales} - \textbf{Cost}$$

- b. **The total profit for each month of the year** which is calculated as the sum of profit of all branches for the month. The months should be printed with their names, *e.g.*, Jan, Feb, etc.
- c. **The total profit of the company for the year.** This figure refers to the total profit from all branches for the particular year.

Figure 1 shows output files that should be generated from analyzing the provided input files.

```
Profit Analysis of Company XYZ for the year 2011

Total Profit For Each Branch
Branch      Profit
A0227 RM 106000
A0389 RM 113000
A1357 RM 158000
A3087 RM 121000
A3548 RM 122000

Total Profit For Each Month
Month Profit
Jan      RM 91000
Feb      RM 74000
Mar      RM 14000
Apr      RM 36000
May      RM 17000
Jun      RM 29000
Jul      RM 67000
Aug      RM 77000
Sep      RM 83000
Oct      RM 67000
Nov      RM 5000
Dec      RM 60000

Yearly Profit: RM 620000
```

(a) Output for the input file “input1.txt”

Profit Analysis of Company XYZ for the year 2012

Total Profit For Each Branch

Branch	Profit
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A0227	RM 172000
A0389	RM 129000
A1357	RM 146000
A3087	RM 204000
A3548	RM 157000
A3778	RM 236000
A5082	RM 165000
A5425	RM 148000
A5669	RM 220000
A6480	RM 99000
A8572	RM 137000
A9478	RM 115000
A9623	RM 152000
B0268	RM 310000
B0935	RM 163000
B2615	RM 124000
B3616	RM 189000
B4080	RM 200000
B8418	RM 169000
B9265	RM 230000
C1635	RM 110000
C2934	RM 114000
C6421	RM 215000
C7679	RM 195000
C8805	RM 180000

Total Profit For Each Month

Month	Profit
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Jan	RM 419000
Feb	RM 382000
Mar	RM 315000
Apr	RM 258000
May	RM 246000
Jun	RM 458000
Jul	RM 405000
Aug	RM 395000
Sep	RM 318000
Oct	RM 398000
Nov	RM 335000
Dec	RM 350000

Yearly Profit: RM 4279000

(b). Output for the input file "input2.txt"

Structured Data and Arrays:

Your program should use proper structured data and arrays to store the records of all branches

User- Defined Functions:

Your program should provide the following functions:

- a. **getBranchProfit** that calculates the total profit for a particular branch.
- b. **getMonthProfit** that calculates the total profit for a particular month.
- c. **getTotalProfit** that calculates the total profit of the company for that year.

All these functions should use proper arrays for their parameters.

Please refer to Table 2 for the assessment criteria and other requirement that you should fulfill.

Table 2: Assessment Criteria

Item	Criteria	Marks
User Input	The user is allowed to enter proper input	1
Input Files	Data are read from the file properly	2
	The read data are stored into an appropriate list	2
	Provide error handling, e.g., for the case like unable to open file	1
Output Files	The output is printed into a file	1
	Profit Analysis Report Title including the “Financial Year”	1
	Total profit for each branch	1
	Total profit for each month	1
	Yearly Profit	1
Functions	getBranchProfit	2
	getMonthProfit	2
	getTotalProfit	2
Arrays	Arrays are properly applied in the program	2
Structured Data	Structured data are properly applied in the program	2
Calculations and Logics	Profit for particular month, particular branch	1
	Total profit for each branch	2
	Total profit for each month	2
	Determine the month name, e.g., Jan, Feb, etc	2
	Yearly Profit	2
	Total	30