

The University of the South Pacific

School of Computing, Information & Mathematical Sciences

CS 112 Data Structures and Algorithms

Tutorial Week 3

Question 1.

This question is based on your previous lab where you were told to determine the grades of students. In this lab you will be using 2 dimensional array to store assignment marks from input file. To make your program simpler assume that final grade just depends on total marks achieved. So you need to calculate the total marks first then use the same grade table that you have used in previous tutorial to determine the grades.

Login to moodle and download *students2.txt* file from *week3: Pointers / Tutorial* folder. *Students2.txt* contains students' IDs and marks achieved in 5 different assignments, one mid semester test and a final exam in their course CS112 in separate columns.

The model solution for week 2 tutorial is given in moodle in *week3: Pointers / Tutorial* folder. You can use your own solution or the model solution for this lab. Please note that in future you will not be given the model solutions.

Update your week 2 tutorial program to meet the following requirements:

- i. Allow the user to read the data just from an input file.
- ii. Update your loop which was retrieving data from a file to store the assignments marks in 2D array and mid-semester marks in 1D array. You can use the while loop given in appendix [1].
- iii. Add a new function in your program to determine the coursework of students. You can use the following function prototype:

```
void determine_students_coursework(int assignment[][TOTAL_ASSIGNS], int  
mst[], int coursework[], int size).
```

Note that arrays are always passed by reference. So you can get the coursework for each student from the *coursework[]* array passed in the above function.

If you have time do the following in the class otherwise complete as homework.

- iv. Write a function to print students' coursework along with their IDs. Use the following function prototype:

```
void print_students_coursework(string id[], int coursework[], int size)
```

- v. Update your code in the *main* to determine grades of all the students. Here you may need to create another 1D array to store total marks.

```
total_marks[studenti] = coursework[studenti] + final_marks[studenti];
```

- vi. Determine how many students have failed CS112 from your program?

DO NOT IMPLEMENT ANY OTHER FUNCTIONALITY AND DO NOT VALIDATE ANY USER INPUTS.

Appendix

[1] The following while loop can be used to read data up to the end of a file.

```
ifstream input;  
...  
while(!input.eof()) {  
    //your code  
    input.get(c);  
}
```