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| **SOUTHERN CROSS UNIVERSITY** |

**ASSIGNMENT COVER SHEET**

For use with online submission of assignments

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| **Unit Name:** | **Fundamentals of Programming** |
| **Unit Code:** | **PROG5001** |
| **Tutor’s name:** | **Dr Thair Al-Dala'in** |
| **Assignment No.:** | **Assignment 2** |
| **Assignment Title:** | **Programming Practice (Algorithm 1 & 2)** |
| **Due date:** | **26.09.2022** |
| **Date submitted:** | **23.09.2022** |

**Declaration:**

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| **Signed:** | **H.G Oshan Manusanka** |
| **Date:** | **23.09.2022** |

**Algorithm 1 & 2 (English & pseudo code)**

**F4: Print the top 10 students with the highest total marks and top 10 students with the lowest total marks (Algorithm 1).**

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Algorithm for sort

**Algorithm (English)**

*Bubble sort Start\*\*\*\**

1.Compare the first and second elements beginning with the first index.

2.They are switched if the first element is greater than the second.

3.Compare the third and second items now. If they are out of order, swap them.

4.The method described above (1,2,3) continues until the final component in studentArr.

5.The remaining iterations follow the same procedure.

*Bubble sort End\*\*\*\**

6.Display "Top 10 students with the lowest total marks"

7.Display the first 10 elements in the studentArr

8.Display "Top 10 students with the highest total marks"

9.Display the last 10 elements in the studentArr

**Algorithm (pseudo code)**

**inputs :** ‘studentArr’ array type of Student

**outputs :** Display the top 10 students with the highest total marks and top 10 students with the lowest total marks

START

1. for (int i = 0; i < studentArr.length - 1; i++)

1.for ( j = 0; j < studentArr.length - i - 1; j++)

1.if (studentArr[j] → totalMark > studentArr[j + 1] → totalMark)

1.Student temp = studentArr[j]

2.studentArr[j] = studentArr[j + 1]

3.studentArr[j + 1] = temp

2.Display "Top 10 students with the lowest total marks"

3.for ( i = 0; i < 10 ; i++){

1. Display studentArr[i] → firstName

}

4.Display "Top 10 students with the highest total marks"

5.for ( i = 1 ; i <= 10 ; i++){

Display studentArr[studentArr.length - i] → firstName

}

END

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**F5: Create a simple menu system to allow users to select and execute each function**

**(Algorithm 2).**

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Algorithm for menu

**Algorithm (English)**

1.Display "WELCOME TO THE CLASS STUDENT MARKS SYSTEM MANAGER"

2.Display "MAIN MENU"

3.Display "F1: Read the unit name and students’ marks from the given text file"

4.Display "F2: Calculate the total mark for each student from the assessment marks and print out the list of students with their name, student id assessment marks and the total mark"

5.Display "F3: Print the list of students with the total marks less than a certain threshold. The threshold will be entered from keyboard"

6.Display "F4: Print the top 10 students with the highest total marks and top 10 students with the lowest total marks"

7.Display "PRESS 0 FOR EXIT"

8.Display "ENTER THE FUNCTION YOU WANT TO RUN (1 / 2 / 3 / 4 / 0) :"

9.Get input for ‘choice’

10.if choice = 1 then call readFile()

11.if choice = 2 then call print()

12.if choice = 3 then call printLessThan()

13.if choice = 4 then call sort()

14.if choice = 0 then break

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**Algorithm (pseudo code)**

inputs :

outputs :

START

1.Display "WELCOME TO THE CLASS STUDENT MARKS SYSTEM MANAGER"

2.Display "MAIN MENU"

3.Display "F1: Read the unit name and students’ marks from the given text file"

4.Display "F2: Calculate the total mark for each student from the assessment marks and print out the list of students with their name, student id assessment marks and the total mark"

5.Display "F3: Print the list of students with the total marks less than a certain threshold. The threshold will be entered from keyboard"

6.Display "F4: Print the top 10 students with the highest total marks and top 10 students with the lowest total marks"

7.Display "PRESS 0 FOR EXIT"

8.Display "ENTER THE FUNCTION YOU WANT TO RUN (1 / 2 / 3 / 4 / 0) :"

9.Input (choice)

10.Switch (choice)

1.case 1:

1.call readFile()

2.Display "File Readed !"

3.call menu()

4.break

2.case 2:

1.call print()

2.call menu()

3..break

3.case 3:

1.call printLessThan()

2.call menu()

3.break

4.case 4:

1.call sort()

2.call menu()

3.break

5.case 0:

1.break

6.default:

1.Display "Wrong input!!! Please try again..."

2.call menu()

END