Swinburne University of Technology Sarawak

COS10009 Introduction to Programming – Semester 1 / 2018

Struct (Lab 08)

Core Task 1

To Do

Struct

Open the ***segment.c*** program file with Quincy. It contains some startup code and comments.

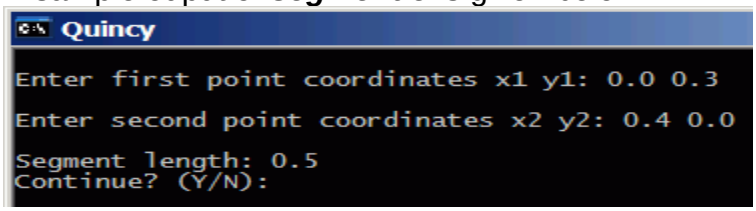
The program requests the coordinates of the two points of a segment. It then calculates and prints the distance using Pythagoras' theorem: The length of the hypotenuse (i.e. the segment) is the square root of the sum of the squares of the sides of the right angle. Therefore if the end points coordinates are (x1, y1) and (x2, y2), the segment length is

*sqrt((x2 - x1) * (x2 - x1) + (y2 - y1) * (y2 - y1))*

To be Completed:

You need to define a "Segment" struct, then complete the given code. The program algorithmic decomposition is given in the comments.

A sample ouput of ***segment.c*** is given below:



Complete, compile, link, and test the **segment** program.

Core Task 2

To Do

Function & Struct (Pass by Reference)

Write a C program following the instructions given below:

a) Define a struct with Std as the tag name. It has three data members: std_id (integer), score (double) and grade (char)
b) Declare a variable called myStd from Std structure type
c) Assign 1111111 to Std_id member of myStd, assign 0.00 to score member of myStd and assign 'N' to grade member of myStd
d) Call a function named Std_Input() to acquire new value for all the three members of myStd from user. (Display the initial values of all the members in myStd before asking for input)
e) Display again the values of all the members in myStd in main()

Vital Task

To Do

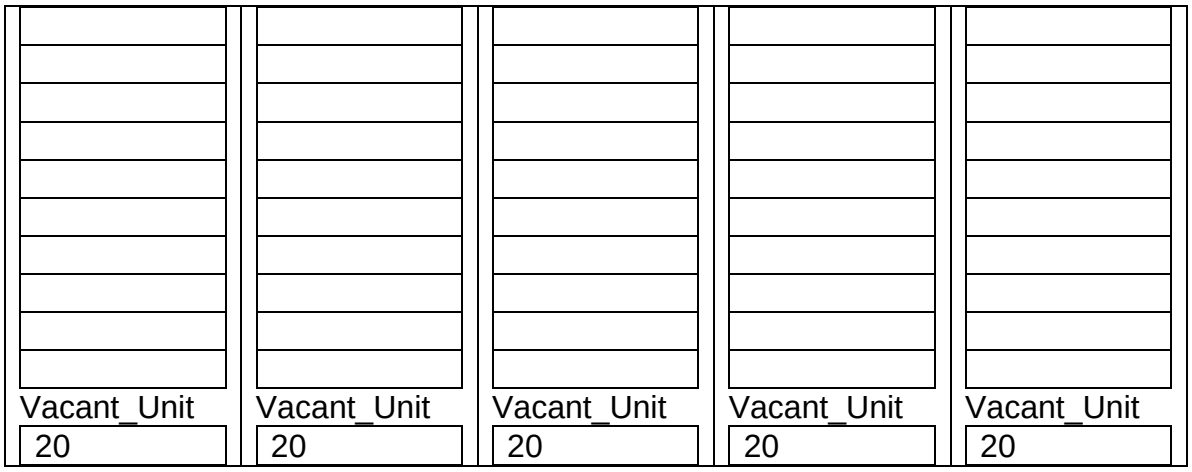
Develop a program to manage the booking of PC for all the five open-labs in the campus.

Each open-lab has the following attributes:

1. Lab ID – int
2. 20 units of PC - int array (each PC is referred by an ID which is the index of the array)
3. Vacant units - int

Define a struct for the open lab base on the attributes listed above.
In the main function, declare an array with size of five to represent all the five open labs. Diagram structure of of the array is shown below:

Lab_ID	Lab_ID	Lab_ID	Lab_ID	Lab_ID
101	201	301	401	501
PC	PC	PC	PC	PC



Write a function check_in() to allow user to make booking, this function will prompt user to input student ID (int) and enter the lab ID he/she wishes to go in, then prompt the user to choose a PC he/she would like to book in that open lab by entering the ID of the PC (0-19). Store the student ID into the array at the location with the index that is identical to the ID of the PC (0-19) selected by user. Each student is only allowed to book one PC in any of the labs at a given time.

Write another function check_out() to allow user to release his/her current booking by using the student ID entered by the user.

The main() function will allow user to choose check in or check-out, it should also display the vacant units of PC in each open-lab after every single booking or release of booking is made by students.