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THE UNIVERSITY OF THE WEST INDIES
ST. AUGUSTINE

EXAMINATIONS OF JULY/AUGUST 2018

Code and Name of Course: COMP1602 COMPUTER PROGRAMMING II

Date and Time: Tuesday 17th July 2018

9am

Duration: 2 Hours

INSTRUCTIONS TO CANDIDATES: This paper has 4 pages and 5 questions

ANSWER ALL QUESTIONS

ALL QUESTIONS ARE NOT EQUALLY WEIGHTED



1.

A text file **sales.txt** contains data on parts. Each line of data (except the last) contains a part name (string), cost price (double), selling price (double) and quantity sold (integer). There are no more than 50 entries in the file. Also, all text data in the file are in uppercase. Data is terminated by a line containing \$\$\$\$ only. Assume that all part names are unique. All part names are single words.

Sample Data

```
LIGHT 500 600 4
MUFFLER 2000 3000.50 5
WIPER 200 250 8
$$$$
```

- (a) Write code to read the data from the text file into an array of structs, **partsArr**, using the following restriction: whenever a record is read, it must be inserted into the array so that the array is always in ascending order of part name.
- Show all relevant declarations. [10 marks]
- (b) After the array has been loaded, write code that prompts the user for a part name and searches the array for that name using a **linear search** technique. If the name exists in the array, return the profit made by the sale of that part, otherwise, return -1. In the data above, LIGHT made a profit of $(600-500) \times 4 = \$400$. Note: Use the order to exit quickly if a part is not found in the array. Assume that all parts make a profit when sold.
- Note:** Assume that the user's input is in uppercase. [6 marks]
- (c) Write a function to increase the selling prices of all parts by 35%. [4 marks]

Total Marks for Question 1 is 20



2. A 5 X 4 array, **arr**, is filled to capacity with positive integers. Write code to find and print:

- (i) all the integers in the array, column by column, i.e. print out the values of the first column followed by the values of the second column etc.
- (ii) the sum of all the elements in the first and last rows. E.g. if the sum of the elements in the first row is 88 and the sum of the elements in the last row is 12, then the sum required is 100.
- (iii) the row number with the highest row sum. Ignore ties.

[10 marks]

Total Marks for Question 2 is 10

3. Assume you have an integer array as shown below and want to sort it in **ascending** order.

6	7	3	4	1	9	8	5
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- (i) Show what the array would look like after the first four passes of an *insertion sort*. [3 marks]
- (iii) Write a function **insertionSort** that accepts an array of integers **arr** and its size, **size** and sorts the array in **ascending** order. [7 marks]

Total Marks for Question 3 is 10

4. Write a function which accepts an array of char, **word**, as input, and returns **true** if the letters of **word** are in alphabetical order or **false**, otherwise. For example,

If **word** is "ABDEFHXZ", the function returns **true**; but given **word** as "COMPUTER", the function returns **false**. Assume that the parameter **size** indicates the number of characters in **word**. [5 marks]

Total Marks for Question 4 is 5

[Turn the Page]



5. A gambler bets \$20 to play the following game:

She throws three 6-sided dice. If the sum of the three numbers thrown is odd, she loses her bet. If the sum is even, she draws a card from a standard deck of 52 cards. If she draws any of the following from the suit of Spades: Ace, 3, 5, 7, or 9, she is paid three times the value of the card plus her \$20 bet. If she draws any other card, she loses her bet. Note that we can assign 1 to the Ace of spades, 2 to the two of spades, and so on up to 13 to the King of spades.

Write code to simulate the playing of 200 games and print the average amount won or lost by the player at the end of the simulation.

NB: The player's bet must be considered when calculating the winnings.

[10 marks]

Total Marks for Question 5 is 10

END OF EXAMINATION