

National University of Computer and Emerging Sciences, Lahore Campus



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| Course: | Computer Networks Lab | Course Code: | CL3001 |
| Program: | BS (Computer Science) | Semester: | Fall 2023 |
| Duration: | 2 hours & 15 minutes | Total Marks: | 25 |
| Date | 25-10-23 | Weight | 25% |
| Section: | BCS-5F | Pages: | 02 |
| Name: | | Roll No.: | |

Do not ask any questions. Cheating or copying someone's code will result in a serious penalty. Submit your files in a folder named as your roll number e.g., "21L-1234" containing all the files on the following path as well as on Google Classroom. Submission on both mediums is necessary:

\\xeon/fall 2023/usama khan/CN/BCS 5F/Midterm/Submissions

Question 1

[5]

Write a C program which should prompt the user to enter the number of elements in the array and then the elements themselves. Implement the bubble sort algorithm to sort the elements in the array in ascending order. Display the sorted array as the final output.

Question 2

[10]

Design a client server system for an online Free Car Rental System having the following specifications:

- Add car details to the system, make and model (e.g; Hyundai Sonata 2023) and also its status if it is available for rent or not. (you may use array or files as per your convenience)
- Remove car details from your db, from array if you are using arrays and from the file if you are using a file to store the car details
- If a user comes (one at a time), he should be able to rent a car from this system. You first need to ask him if he wants to rent a car or add its details for others to rent it or return an already rented car.
- If he wants to make it available for others to rent it, then get details from him regarding the vehicle and add it to your available cars list (array or file)
- If no cars are available, then he should get a prompt that NO cars are available if he chooses to rent it.
- Once the car is rented, it should not be available for rent anymore. Make sure to update its status. '0' means 'not available for rent' and '1' means 'available for rent'. For example: 'Hyundai Santro 2002 1' means that this car is available for rent. And 'Hyundai Sonata 2023 0' means it is not available for rent, it must be on rent already.
- User can return the car when it is no more needed. Make sure to make it available again, since the car is now returned by the customer.

Question 3

[10]

****Submission: You have to submit your (Roll-No.docx) word file in answer to this question. You should provide proper answers along with screenshots. Make your word file with a proper format indicating all the question numbers and the corresponding answers****

*******Use file ‘*Capture 1*’ for questions 1-4 below*******

1. Filter out all TCP packets which are either going to or coming from IP: 128.119.245.12 on Port: 80. Write your filter as answer.
2. Suppose we take the fifth filtered packet as Packet No. 1, with each successive packet increasing one in number, then what is the request made in Packet No. 16 and what is the response from the server. Mention the packet no. of server response. After how many packets the server send the response? How many data containing TCP Segments are present between the request made and response received?
3. Filter out all the TCP SYN packets. How many SYN packets are sent through the host? Write your filter as answer.
4. Apply simple HTTP filter and answer what is the data length in bits returned by the server in Packet No. 2 and 4, considering 1st filtered packet as packet No. 1.

Best of Luck ☺