

National University of Computer and Emerging Sciences, Lahore Campus



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-5D	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 5D/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 Book Rental System having the following specifications:

- Add book details to the system, title and author (e.g; Oliver Twist, Charles Dickens) and also its status if it is available for rent or not. (you may use array or files as per your convenience)
- Remove book details from your db, from array if you are using arrays and from the file if you are using a file to store the book details
- If a user comes (one at a time), he should be able to rent a book from this system. You first need to ask him if he wants to rent a book or add its details for others to rent it or return an already rented book.
- If he wants to make it available for others to rent it, then get details from him regarding the book and add it to your available books list (array or file)
- If no books are available, then he should get a prompt that NO books are available if he chooses to rent it.
- Once the book 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: 'Oliver Twist, Charles Dickens 1' means that this book is available for rent. And 'Prince and the Pauper, Mark Twain 0' means it is not available for rent, it must be on rent already.
- User can return the book when it is no more needed. Make sure to make it available again, since the book 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 2’ for questions 1-4*******

1. Apply a capture filter to obtain all the packets that are either going from client IP: 192.168.1.2 to server TCP Port: 21 or from server IP:195.89.6.167 and server TCP Port: 20 or 21. Write the filter which you have applied?
2. Apply a filter to get all the packets which are directed from client with MAC Address: 00:0e:f4:d2:2a:bf to other ports but not to Server UDP Port: 53. What filter did you apply?
3. Apply a filter to get all the UDP packets which are directed towards Port Number 53 either by client or by server. What filter did you apply? If we take the first filtered packet as Packet No. #1 with each successive packet increasing one in number, then what will be the acknowledgement number of the DNS request made in Packet No. 12?
4. Filter UDP packets containing particular sequence 192.168.***.***

Best of Luck ☺