

Lab Assignment Sheet-Even 2019

Software Development Lab-II (15B17CI271)

Important Instructions:

1. All students are required to attend at least 80% labs.
2. There will be two lab tests of 20 marks each. In case anyone misses Lab test 2, student will be awarded “F” Grade irrespective of attending labs for the whole semester.
3. There will be 2 Quizzes. Quiz 1 of 10 marks and Quiz 2 of 10 marks each.
4. There will be mini project of 25 marks based on concepts of data structure and C programming.
5. 15 marks are reserved for attendance. The evaluative lab assignments must be evaluated as per deadlines from time to time.
6. Evaluation schedule is as follows:

Practice Lab	-	5 th Jan-12 th Jan	
Practice Lab	-	14 th Jan-19 th Jan	
Practice Lab	-	21 st Jan-26 th Jan	
Quiz -1 + Synopsis	10 Marks + 5 Marks	28th Jan-2rd Feb	Arrays, structures, functions using pointers
Practice Lab	-	4 th Feb-9 th Feb	
Lab Test -1	20 Marks	18th Feb-23rd Feb	Searching, Sorting, Dynamic Memory Allocation, File handling, Stack with their Applications
Practice Lab	-	25 th Feb-2 nd Mar	
Practice Lab	-	4 th Mar-9 th Mar	
Practice Lab	-	11 th Mar-16 th Mar	
Quiz -2	10Marks	18th Mar-30th Mar	Queues, Linked List and binary tree
Practice Lab	-	8 th April-13 th April	
Practice Lab	-	15 th April-20 th April	
Project Evaluation	20 Marks	22nd April-27th April	Working demo of project, viva and submission of report. Report format will be available soon.
Lab Test -2	20 Marks	29th April-4th May	OOPs Programming [Classes, Objects, constructors, destructor, operator overloading, Inheritance]
Practice Lab	-	6 th May-14 th May	

Lab Assignment 1

Week 1 (5th Jan – 12th Jan 2019)

1. Write a C function “array_arrange” which arranges the numbers of an array in ascending order. Consider that the user will enter the number randomly for array in the main function.
2. Create a structure to specify data of customers in a bank. The data to be stored is: Account number, Name, Balance in account. Consider total 10 customers in the bank.
 - a. Display the Account number and name of each customer with balance below Rs. 10000. Then display a message that balance of Rs 10000 is not maintained.
 - b. If a customer request for withdrawal or deposit by passing Acct. no, amount, code (1 for deposit, 0 for withdrawal), then first update the total amount left in balance and then display it.
3. Define a structure containing two members of an integer quantity and a floating quantity. Compute average and standard deviation of the numbers and print them.
4. Write a C Program which displays the capital when a user enters the country name at run time. The user will enter details of country in a matrix with two columns, col1 represents the country name and col2 represents the capital. Take the assumption that number of countries will be minimum 10.
5. Take an array of integers as an input and then search for any number “k”.
 - a. Write a program to print all its occurrences using recursion and non recursion.
 - b. Use strcmp to look for a certain word occurrence in an array. Make sure array contains at least 20 words

Lab Assignment 2

Week 2 (14th Jan – 19th Jan 2019)

1. Write a menu driven program that takes two numbers from user and find the sum, product, and difference using pointers and functions.
2. Write a C program that reverses the elements of a given array. Use pointers and functions
3. Write a program that will round a floating point number to an indicated decimal place. For example the number 17.457 would yield the value 17.46 when it is rounded off to two decimal places. Ask the user to input the rounding off value. Use pointers and functions.
4. Write a program using pointers and functions that takes an integer parameter m representing the month number of the year and returns the corresponding name of the month. For instance, if m =3, the month is March.
5. Declare a structure to represent a complex number (a number have real part and imaginary part). Write a program using pointers to perform following operation:
 1. Add two complex numbers.
 2. Subtract two complex numbers.
 3. Multiply two complex numbers.
 4. Divide two complex numbers.
6. Write a C Program with the following functions:
 - (a) double *Random(int n) Function dynamically allocates array of size n, where every element is a random real number between 0 and 1. Function returns pointer to this array.
 - (b) double *Max(double *A, int n) Function returns pointer to the maximum value in array A. Use these two functions in main program: pass array created by Random function to other function and print results
7. Write code for following functions using pointers:
 - a) Accept an array of 10 integers and return pointers to its second largest element.
 - b) Accept two strings str1 and str2 as parameters and return a pointer to a position where string str2 is found in str1 and null otherwise.
 - c) Accept two strings str1 and str2 and one integer value m as parameter and inserts the str2 into str1 immediately after index m.
 - d) read a string using pointers and finds the longest substring which is a palindrome.

8. Write a menu driven C program to store the following details of students in a class using structures and pointers : {Name, Roll No., City, CGPA, Semester}. Write different functions for reading and displaying details.

- a) Read details of 10 students and display the name of the students whose CGPA is same in consecutive two semesters.
- b) Print the name of students whose CGPA is below 5.
- c) Print the names of all those students whose Name start with "A".

Lab Assignment 3 and 4

Week 3 & 4 (21st Jan – 2nd Feb 2019)

1. Write a program in C to input a list of names from user and do the following:
 - a) Write these names into a file
 - b) Read this list of names from the file and sort them alphabetically
 - c) Write this sorted list into another file
2. Write a program to compare two files specified by the user, displaying a message indicating whether the files are identical or different.
3. Write a program in C that opens two files as FILE1.txt and FILE2.txt. WAP to print line1 of the first file, line 1 of the second file, line 2 of the first file, line 2 of the second file and so on, till end of either of the file. On reaching EOF in any of the two files copy and print the remaining contents.
4. Write a C program to sort the n names in an alphabetical order. Prompt the user to enter n names.
5. Here is a snapshot of a file which stores students' details:
Sno Branch Name 1 CS Ram 2 IT Shyam 3 BT Sita
 - a) Write a C program to write all the members of array of structures (given above) to a file using fwrite(). Read the array from the file and display on the screen.
 - b) Modify above program by including students' CGPA too. Now read the file and display the CGPA in ascending order (use selection or insertion sort) and write back this sorted list in another file.
 - c) Read this sorted file and determine largest and smallest elements in the list and write these values at the end of file.
6. Write a C to read name, id and salary of n numbers of employees from the user and store them in a file. Now write a function to convert the small case characters of the entered name to upper case and print the output on the screen.

Lab Assignment 5

Week 5 (4th Feb – 9th Feb 2019)

1. Write a program to find the sum of the numbers placed at even and odd positions using stack.

2. You have a bracket sequence made up of opening '(' and closing ')' parentheses. Write a program to check whether this bracket sequence is balanced or not.

$(a * b (c + e ((d - g) + (f - h))))$

3. Write a C to read name, id, year and branch of n numbers of students from the user and store them in a file. Now write a function to convert the small case characters of the entered name to upper case and print the output in same order on the screen using stack.

4. Write a program to get prefix and postfix of following arithmetic expression and further evaluate it to obtain the computed value.

$(6 + 8 * 5) - ((9 - 7) / 2 * 5) * 3 / 2$

5. A letter means push and an asterisk means pop in the following sequence. Give the sequence of values returned by the pop operations when this sequence of operations is performed on an initially empty LIFO stack.

S O F T * * W A * R * E D E V E * * * L * * O P M * E N T *

6. Write a program to clone a stack without using extra space.

7. Write a program where a user enters the numbers into a stack and whenever a 0 is entered the stack performs two operations:

a. Pop out all the elements entered before 0.

b. Push the total number of elements inserted before 0 into the stack. Repeat the process until 5 five zeros have been encountered.

Lab Test -1
Week 6 (18th Feb – 23rd Feb 2019)

Syllabus for Lab Test-1 ---- Searching, Sorting, Dynamic Memory Allocation, File handling, Stack with their Applications.

Lab Assignment 6

Week 7 (25th Feb – 2nd Mar 2019)

1. Write a program in C to sort the elements using queue.
2. Write a program in C using queue to check whether a string is palindrome or not.
3. Write a program in C to check whether the circular queue is full or not.
4. Write a program in C to implement dequeue using array for performing the following operation:
 1. Create
 2. Insert (front and rear)
 3. Delete (rear and front)
 4. Print the elements of the queue
5. Implementation of a stack using queues.
6. For circle of n persons Q and an integer k . Find the last person of the circle as winner using function $\text{Win}(Q,k)$ i.e. every time k th person from the circle get eliminated.
7. New Air Airways (NAA) is a new airline company in India. NAA is a small company and can only afford to rent one check-in counter at Delhi airport. Most customers of NAA are from business accounts and the manager wishes to ensure that these customers are treated best. NAA thought of a plan where the passengers would wait in two different rows, one for normal customers and one for business customers. NAA wishes to examine the efficiency of the following two schemes and the original system without distinction:
 - a) All passengers wait in a single row
 - b) Passengers are served alternatively. One from the business row and one from the normal row. In case any row is empty then the order is jumped
 - c) Every two business passengers served then one normal passenger is served.To help NAA make a decision on which is the best scheme, you are asked to provide a simulation of the process for 500 passengers. In your simulation you can make the following assumptions:
 - 35% of the passengers are business passengers.
 - The first 50 passengers come at an average rate of 70% the check-in processing time. The next 250 at a rate of 200% the check-in processing time and the remaining 200 at 90% the rate of the check-in processing time.Simulate the process and provide as output the average and maximum time a passenger from each group had to wait (counted in the number of passengers that were served before him/her). Repeat the same process assuming that the percentage of business customers rose to 55%.