

18CSL31 DATA STRUCTURES LABORATORY
(Common to CSE & IT branches)

I. LIST OF EXPERIMENTS

S.No.	Batch Allocation for Cycle of Experiments												
1.	<p>A music player needs to store Illyaraja's hit songs. Develop a C program to implement the following operations:</p> <ol style="list-style-type: none"> Read the hit songs of Illyaraja and store it in the beginning of the music player Get a song „x“ and search „x“ in music player. If „x“ is present then play the song otherwise add to the list of the songs Display the songs in the music player and count the number of songs in the music player Select a song „x“ from music player and play the previous and next song Print the play list in reverse order 												
2.	<p>Perform the following polynomial operations:</p> <ol style="list-style-type: none"> Add $10x^5+2x^3-1$ to $8x^4-x^3+16x^2$ Subtract $100x^4-19x^2-7x$ from $150x^3+8x-14$ 												
3.	<p>When multiple applications are running on a PC, it is common for the operating system to put the running applications on a list and then to cycle through them, giving each of them a slice of time to execute and then making them wait while the CPU is given to another application. When the operating system reaches the end of the list it can cycle around to the front of the list. Assist the operating system to perform the above operations using the appropriate data structure.</p>												
4.	<ol style="list-style-type: none"> Perform infix into postfix expression conversion. Consider that you are given the following C program: <pre>void main() { printf("KONGU"); if((a>b)&&(b>c)) }</pre> <p>When the program is executed, the compiler reports an error "Missing parenthesis". Show how the compiler detects the error.</p> 												
5.	<p>Write a program to show how the evaluation of an expression takes place in a computer.</p> <p>For example: <code>printf("%d",(2* 5 +(7+9)))</code>; will produce the output 26. <code>printf("%d",(2*(5 +(7+9))))</code>; will produce the output 42.</p>												
6.	<p>Assume 'n' number of air planes are waiting for the instruction to land. The services are provided from the ground station on first come first serve basis.</p> <ol style="list-style-type: none"> Display the order in which the air planes are serviced Display the air planes in the order of waiting time in air (Lowest to highest) 												
7.	<p>Implement the following service using priority queue.</p> <table border="0" style="width: 100%;"> <tr> <td style="text-align: left;">Vehicle Type</td> <td style="text-align: right;">Priority (Assume lowest value has highest priority)</td> </tr> <tr> <td>Medium Passenger Vehicle 2</td> <td></td> </tr> <tr> <td>(Bus)</td> <td></td> </tr> <tr> <td>Light motor vehicle(cars)</td> <td style="text-align: right;">4</td> </tr> <tr> <td>Ambulance</td> <td style="text-align: right;">1</td> </tr> <tr> <td>Medium goods vehicle</td> <td style="text-align: right;">3</td> </tr> </table>	Vehicle Type	Priority (Assume lowest value has highest priority)	Medium Passenger Vehicle 2		(Bus)		Light motor vehicle(cars)	4	Ambulance	1	Medium goods vehicle	3
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8.	<p>Suppose the customer is getting online orders placed and he wants to maintain the live data in sorted order of prices. For example, he wishes to know the number of items purchased at cost below a given cost at any moment. Or he wishes to know number of items purchased at higher cost than given cost. Help the customer to implement the above scenario.</p>												

9.	Google maps uses graphs for building transportation systems, where intersection of two(or more) roads are considered to be a vertex and the road connecting two vertices is considered to be an edge, Visit the roads using BFS and DFS.
10.	Consider that the height of the student has to be maintained in a tree. The tree height must be balanced at all the time. Implement it with a suitable data structure.
11.	A person wants to travel from a home city to all other cities. Find the order in which the person has to visit the cities (No need to return back).
12.	Implement the operations of Red Black tree: <ul style="list-style-type: none"> i. Store a number on to the tree ii. Delete a number from the tree iii. Display all the numbers in the tree

II. COURSE OUTCOMES (COs)

At the end of this course, student will be able to:

CO	Description
CO1	identify the appropriate data structure for solving the given problem
CO2	use a data structure to implement another data structure
CO3	synthesize operations like searching, insertion, deletion and traversing on various data structures

III. MAPPING OF COURSE OUTCOMES (COs) TO PROGRAM OUTCOMES (POs)

3	Substantial	2	Moderate	1	Slight
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POs													PSOs	
POs/PSOs	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO ₁	3	2	1	1	1								3	1
CO ₂	3	2	1	1	1								3	1
CO ₃	3	2	1	1	1								3	1
Average	3	2	1	1	1								3	1

IV. COURSE DELIVERY METHODS

Teaching Methodology	Assessment tools
<ul style="list-style-type: none"> • Use of Black board • Demonstrating simple programs • Practical realization • Provoking Questions and Discussion 	<ul style="list-style-type: none"> • Conduct of experiment • Observation • Record • Viva Voce • Model practical examinations • End semester practical examination