संगणक विज्ञान एवं अभियांत्रि की विभाग
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List of Laboratory Programs

Design and Analysis of Algorithms Laboratory (CS14203)

Instructions:

- The programs should be implemented in C, C++, Java or Python.
- The programs are to be developed without using the built-in functions or APIs.
- You have to execute the programs and upload the executed program files (.c, .cpp, .java or .py) in google class only.
- All the program must be executed without any errors and warnings.
- You have to prepare a laboratory report (.doc/.pdf) having all the executed programs throughout the semester. The report has to be submitted at the end of the semester while asked to submit. You are advised to prepare the report day by day.

Programs:

Lab 1. (a) Write a program for Merge Sort algorithm.
(b) Write a program using Divide and Conquer method to find out maximum and minimum element from an array.

Lab 2. Write a program for Strassen's matrix multiplication algorithm to multiply two square matrices A and B with size $N \times N$. The size of the input matrix (i.e., N) will be given during runtime. Although, the Strassen's matrix multiplication algorithm is design in such a way that N should be an integer of power of 2 (i.e., $N = 2^K$), your program should support any positive integer value of N.

Lab 3. Write a program for Knapsack Problem using Greedy Method.

Lab 4. Write a program for Prim's Algorithm to find out Minimum Spanning Tree (MST) from a given weighted graph.

Lab 5. Write a program for Krushkal's Algorithm to find out Minimum Spanning Tree (MST) from a given weighted graph.

Lab 6. Given a set of n number of jobs, $J = \{j_1, j_2, ..., j_n\}$ and p number of identical machines $M = \{m_1, m_2,..., m_p\}$, write a program using greedy mathod to assign the jobs to the machines such that overall completion time (makespan) of the jobs will be minimum. Consider the job j_k has execution time t_k for all $k = 1, 2,..., n$.

Lab 7. Write a program for matrix-chain multiplication problem based on dynamic programming.

Lab 8. Write a program for optimal binary search tree based on dynamic programming.

Lab 9. Write a program for BFS and DFS algorithm.

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