CS 293 Lab 1

20th July, 2018

General Instructions

1. Attendance is MUST.
2. Assessment
    a. Regular Lab -- Programs need to be submitted online 10%
    b. Graded Lab -- 4 (Total 40%)
    c. Midterm exam -- 20%
    d. End semester exam -- 30%
3. Academic Honesty Policy:
    http://www1.iitb.ac.in/newacadhome/rules.jsp
4. Strictly follow the instruction given in the question.

Code Submission

Format:

- One file for each program, e.g., Program1.cpp, Program2.cpp, . . .
- Zip all the files with your roll number as the name of the file, e.g., 172050011.zip.
- Upload the zipped file at moodle.
- Deadline is Today (20-Jul-2018) by 5PM.

Program 1: Fibonacci

- Write a program to print Fibonacci series
    - Iteratively
    - Recursively
- Input for the program is the length of the fibonacci series
- Output will be the elements of the series
- Compare the time taken in the 2 approaches when the input is 10, 20, 30 and 50.

Program 2: Factorial

- Write a program to calculate factorial of a given number
    - Iteratively
    - Recursively
- Input for the program is the number
- Output will be the factorial of that number
- Compare the time taken in the 2 approaches when the input is 10 and 12

Program 3: Sorting

- Create a randomly ordered list of numbers from 1 to 100 (both inclusive)
- Write the Bubble sort program to sort the above list. (Note down the time to perform the sorting)
- Write the Modified-Bubble Sort program to sort the list. (Note down the time to perform the sorting)
- Compare the two timings
- Compare the timing of two algorithms for the sorting of already sorted list of numbers 1-100

PS: In Modified-Bubble sort, there is checking condition which breaks the loop if the list is sorted, after each pass.

Program 4: Matrix Multiplication

- Write a program for matrix multiplication of two n*n matrix
- Input for the program is n and the elements of the two matrix
- Output is the result of the multiplication

Program 5: Tower of Hanoi

Given 3 pegs and n disks as shown in the image, write a program to move the disks from peg A to peg C (You can use peg B for temporary storage). Following conditions should be satisfied while transferring the disks:

- You can move only one disk at a time
- You can move only the top most disk from any peg
- You cannot place a disk on top of a smaller disk