DSA Lab Assignment Set – I

1. Write a program to compute the factorial of an integer *n* iteratively and recursively. Check when there is overflow in the result and change the data types for accommodating higher values of inputs.

2. Write a program to generate the *nth* Fibonacci number iteratively and recursively. Check when there is overflow in the result and change the data types for accommodating higher values of inputs. Plot the Fibonacci number vs *n* graph.

3. Write programs for linear search and binary search for searching integers, floating point numbers and words in arrays of respective types.

4. Write a program to generate 1,00,000 random integers between 1 and 1,00,000 without repetitions and store them in a file in character mode one number per line. Study and use the functions in C related to random numbers.

5. Write a program to generate 1,00,000 random strings of capital letters of length 10 each, without repetitions and store them in a file in character mode one string per line.

6. Store the names of your classmates according to roll numbers in a text file one name per line. Write a program to find out from the file, the smallest and largest names and their lengths in number of characters. Write a function to sort the names alphabetically and store in a second file.

7. Take a four-digit prime number *P*. Generate a series of large integers *L* and for each member *Li* compute the remainder *Ri* after dividing *Li* by *P*. Tabulate *Li* and *Ri*. Repeat for seven other four digit prime numbers keeping *Li* fixed.

8. Convert your Name and Surname into large integers by juxtaposing integer ASCII codes for alphabet. Print the corresponding converted integer. Cut the large integers into two halves and add the two halves. Compute the remainder after dividing the by the prime numbers *P* in problem 7.