

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 n th 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 L_i compute the remainder R_i after dividing L_i by P . Tabulate L_i and R_i . Repeat for seven other four digit prime numbers keeping L_i 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 result by the prime numbers P in problem 7.
9. Write a program to check whether a given number is perfect. If it is a perfect number, add '97' to each of its digits. Now consider the result as an ASCII series. Convert the same into equivalent character sequence.

Perfect Number is a Positive Integer (Greater Than Zero) whose divisor's sum is equal to the number.

The Smallest perfect Number is 6.

Divisors of 6 are 1, 2 and 3. The sum of its Divisors is $1 + 2 + 3 = 6$.
10. The Edit Distance between two strings is defined as the number of inserts and deletes of characters needed to turn one into another. Write a program to find the Edit Distance between two strings of capital letters.

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