National Institute of Technology, Calicut
Department of Computer Science and Engineering
CS2094 – Data Structures Lab

Practice Problems

1. Write a program to print all prime numbers which are palindromes in the range [1,N].

   Input: 'n' in the range of $0 – 2^{31}$
   Output: prime numbers which are palindromes

   Example
   Input:
   Enter the value of n
   150
   Output:
   11
   101
   131

2. Define a recursive function to compute the greatest common divisor (GCD) of two non-zero positive integers using the remainder method.

   Input: Two non-zero positive integers
   Output: GCD of the two numbers

   Example
   Input:
   160, 100
   Output:
   20

3. Given a word ***str*** and the name of a text file, write a program to find the total number of occurrences of ***str*** in the specified file.

   Input: Name of the text file and **str,** a string consisting only of letters from the English alphabet[a-zA-Z]
   Output: number of occurence of **str** in the text file

   Example
   Sample text file *text.txt*: "India is my country. All Indians are my brothers and sisters."
   Input: text.txt, my
   Output: 2

4. Given two strings, say s_1 and s_2, write a program to concatenate the two. The final string (which should be in s_1) should have the contents of s_1 followed by that of s_2. The program must use pointers to access the strings.

   Input: Two strings s_1 and s_2
   Output: concatenated string s_1

   Example
   Input: Good, Morning
   Output: GoodMorning

5. Write a menu driven program to perform the following operations on a linear linked list:
    a) CREATE
    b) INSERT
    c) DELETE
    d) COUNT

Sample Input and Output:

SINGLY LINKED LIST

a) CREATE

b) INSERT

c) DELETE

d) COUNT

e) EXIT

ENTER YOUR CHOICE : a

ENTER THE DATA: 10

10

SINGLY LINKED LIST

a) CREATE

b) INSERT

c) DELETE

d) COUNT

e) EXIT

ENTER YOUR CHOICE : b

ENTER THE DATA: 30

ENTER THE POSITION: 1

30
10

SINGLY LINKED LIST

a) CREATE

b) INSERT

c) DELETE

d) COUNT

e) EXIT

ENTER YOUR CHOICE : c

ENTER THE POSITION : 2

30

SINGLY LINKED LIST

a) CREATE

b) INSERT

c) DELETE

d) COUNT

e) EXIT

ENTER YOUR CHOICE : b

ENTER THE DATA: 40

ENTER THE POSITION: 2

30

40

SINGLY LINKED LIST

a) CREATE

b) INSERT

c) DELETE

d) COUNT

e) EXIT

ENTER YOUR CHOICE : d

NUMBER OF NODES IN THE LIST: 2