

LAB IX

1. Complete the details of the program given below at appropriate places (see the comment parts of the program). After completion of the function **reverse**, the first string is written in reverse order. After completion of the function **check_char**, if flag=1 then the input character is present in the second string; otherwise flag=0.

ql9p1.c

Expected output:

```
First string is :Hellow world
First string after function call is :dlrow wolleH
Enter the search character:9
The character 9 is present in "MTH409: C program"
```

```
First string is :Hellow world
First string after function call is :dlrow wolleH
Enter the search character:c
The character c is not present in "MTH409: C program"
```

2. A file **poly.dat** contains the degree n of a polynomial followed by its $(n + 1)$ coefficients in descending order of power. Write a program that do the following:
 - (a) It reads the degree n of the polynomial, creates a dynamic 1-D array like variable **a** that can hold its $(n + 1)$ -coefficients and reads the $(n + 1)$ -coefficients in **a**.
 - (b) It then prints the polynomial in an appropriate form.

For each of the step (a) and (b), use appropriate function.

Expected input: See **poly.dat**

Expected output:

```
The polynomial is :2.50 x^7-3.00 x^2+2.00
```

3. The data file **matA.dat** contains data for the matrix A whose first line contains row and column dimensions of A followed by the matrix arranged row-wise. Also, the data file **vecX.dat** contains data for column vector X whose first line contains order of X followed by its components.

Copy the given code with modifications at appropriate places (see the comments of the program). After completion of the function **matread**, **m** and **n** contain the row and column dimensions of A and the components of A are read in a dynamic 2-D array like variable A. These are read from the file **matA.dat**. The function **matprintt** prints a matrix in the terminal. After completion of the function **vecread**, **p** contains the column dimension of X and the respective components are stored in a dynamic 1-D array like variable X. These are read from the file **vecX.dat**. The function **vecprintt** prints a vector in the terminal. After completion of the function **matvecm**, flag=0 if the matrix-vector multiplication $B = AX$ is not possible. Otherwise, flag=1, **k** contains the column dimension of B and the components of B are stored in a dynamic 1-D array like variable B. After call to the function **vecprintf**, the column vector B is printed in a file **vecB.dat** in which the first line contain the dimension of B.

ql9p3.c

Expected input: See **matA.dat** and **vecX.dat**

Expected output:

The matrix A is:

2.0000 0.0000 5.0000 1.0000

4.0000 0.0000 -6.0000 1.0000

5.0000 1.0000 2.0000 1.0000

The vector X is:

3.0000

-4.0000

7.0000

8.0000

The vector B is:

49.0000

-22.0000

33.0000

Also see **vecB.dat**