# LAB X

1. Create a data file **polyl.dat** in which each line contains coefficient and degree of a term. The last line with -1 for degree and any number for coefficient indicates the end the file. The last line is not a term of the polynomial. Note that the terms of the polynomial may not be sorted in the data file.

   Copy the given code (omitting the comments) with modifications at appropriate places (see the comment parts of the program).

   (a) After completion of the function **polcreate**, the linked list is created and the variable **poly** has the address of the starting node of the list.

   (b) Function **polprint** prints the polynomial.

   (c) Function **sortpol** is used to sort the linked list of the polynomial.

   (d) Function **insertpol** is used to insert a given term into the sorted polynomial.

   (e) Function **delpol** is used to delete a given term from the polynomial.

```c
#include <stdio.h>
#include <stdlib.h>
struct node
{
double coeff;
int deg;
struct node *next;
};
typedef struct node node;
//Write the prototypes of polprin,polcreate,sortpol,insertpol,delpol
int main()
{
    char c;
    int ch;
    node *poly;
    poly=polcreate("polyl.dat");
    if(poly==NULL)
    {
    printf("Polynomial is not created, data set is empty\n");
    return 0;
    }
    printf("The polynomial is:\n");
    polprint(poly);
    printf("Enter 1 to sort the polynomial:");
    scanf("%d",&ch);
    if(ch==1)
    {
    sortpol(poly);
    printf("After Sorting, the polynomial becomes:\n");
    polprint(poly);
    }
    else
    {
    printf("Polynomial is not sorted: stop\n");
```

```
        return 0;
        }
        printf("Enter 2 to insert, 3 to delete a term into the sorted polynomial:");
        scanf("%d",&ch);

        if(ch==2)
        {
        insertpol(&poly);
        printf("After insertion, the polynomial becomes:\n");
        polprint(poly);
        }
        else if(ch==3)
        {
        delpol(&poly);
        printf("After deletion, the polynomial becomes:\n");
        polprint(poly);
        }
        else
            printf("The polynomial remains unchanged\n");
    return 0;
    }
    //Write details of function polprint here
    //Write details of function polcreate here
    //Write details of function insertpol here
    //Write details of function delpol here
    //Write details of function delpol here
```

*Expected input and ouput*:
For polyl.dat

```
2    3
0    -1

The polynomial is:
2.00 x^11-3.50 x^7 -1.00 x^2 +7.00 x^21 +8.00 x^5 +1.00 x^3
Enter 1 to sort the polynomial:1
After Sorting, the polynomial becomes:
7.00 x^21+2.00 x^11 -3.00 x^7 +8.00 x^5 +1.00 x^3 -1.00 x^2
Enter 2 to insert a new term into the sorted polynomial:2
Enter coeff and deg: -4 4
After insertion, the polynomial becomes:
7.00 x^21+2.00 x^11 -3.00 x^7 +8.00 x^5 -4.00 x^4 +1.00 x^3 -1.00 x^2
Enter 3 to delete a term from the sorted polynomial:3
Enter deg of the term to be deleted: 11
After deletion, the polynomial becomes:
7.00 x^21-3.00 x^7 +8.00 x^5 -4.00 x^4 +1.00 x^3 -1.00 x^2
```