

CSE 102 Homework Assignment 4 (Due: November 2, 11:55 pm)

You are going to write a complete C program which implements the following functionality:

- Your program will read two input files:
 - values.txt
 - polynomial.txt
- Your program will create a file:
 - evaluations.txt
- Your program will evaluate the same polynomial for each value read from values.txt and write the results to evaluations.txt

values.txt

This file holds double numbers separated by whitespace.

```
12.5 5 67.89 -6 -13.37
```

There may be as many as 100 double numbers in this file.

polynomial.txt

This file holds a polynomial in a character array form.

```
5x+23.5x^3-x^2
```

There will only be one polynomial expression. monomials are not ordered according to the powers of the variable x. The coefficient of x at each monomial is written before the character x. Powers of x is represented by character ^ followed by a number. Each monomial will certainly include a character x.

The length of a polynomial expression can reach up to 1000 characters.

evaluations.txt

This file will hold the results of polynomial evaluations for each value read from values.txt. If your polynomial string is 5x+23.5x^3-x^2, set x to be the value(one of the numbers read from values.txt) and evaluate the mathematical expression: evaluation = 5*x + 23.5*x*x*x - x*x. For the given example above, evaluations.txt will be as follows:

```
45804.69
2937.50
7349081.25
-5142.00
-56410.13
```

Remarks:

- In order to convert char arrays to numbers, you can use function sscanf() which is defined in <stdio.h>. For example:

```
double d1,d2;
char a[] = "12.5 63.4"
sscanf(a, "%lf%lf", &d1, &d2);
/* d1 stores 12.5 and d2 stores 63.4 */
```

- In order to find powers of a number, you can use pow() function defined in <math.h>

Turn in:

A complete C program <assignment_4_name_id.c> which can be compiled using the following command:

```
gcc -std=c99 assignment_4_name_id.c -o assignment_4_name_id
```

Caution:

- Read and apply “Assignment Submission Rules and Other Related Information” document which available on the class e-learning system.
- You may or may not get partial credit depending on how you structured or documented your code.