
CS29003 Algorithms Laboratory

Assignment 1: PDS Brush Up

General instruction to be followed strictly

1. Do not use any global variable unless you are explicitly instructed so.
2. Do not use Standard Template Library (STL) of C++.
3. Use proper indentation in your code and comment.
4. **Name your file as <roll_no>_<assignment_no>. For example, if your roll number is 14CS10001 and you are submitting assignment 3, then name your file as 14CS10001_3.c or 14CS10001_3.cpp as applicable.**
5. **Write your name, roll number, and assignment number at the beginning of your program.**
6. Make your program as efficient as possible. Follow best practices of programming.
7. Submit your program on Moodle before deadline. Submissions by email or any other means will NOT be considered for evaluation.

In this assignment, you write an interactive menu-based program to perform various operations on real polynomials. Use single linked list to store a polynomial. Use the following structure for a node of the single linked list.

```
typedef struct _node{
int exponent;
double coefficient;
struct _node *next;
} node;
```

Implement the following functions.

```
void print_polynomial(node*)
node* add(node*, node*)
node* subtract(node*, node*)
node* multiply(node*, node*)
```

Note that the input polynomial may not be sorted with respect to the exponents. However, the output polynomial must be sorted in decreasing order of the exponents. All floating point and double numbers should be printed with two decimal places.

Submit a single .c or .cpp file. Your code should get compiled properly by gcc or g++ compiler.

Sample Output

```
palash@palash-ThinkPad-X1-Yoga-3rd:~$ ./a.out
1. Add polynomials
2. Subtract polynomials
3. Multiply polynomials
4. Exit
1
Write the first polynomial as a sequence of exponents and coefficients
terminated with non-number character.
10 2.3 7 -4.5 0 12 o
Write the second polynomial as a sequence of exponents and coefficients
terminated with non-number character.
8 5 7 4.5 1 11 0 -2 g
The sum of the two polynomials is
10 2.30 8 5.00 1 11.00 0 12.00
3
Write the first polynomial as a sequence of exponents and coefficients
terminated with non-number character.
2 1 0 5 p
Write the second polynomial as a sequence of exponents and coefficients
terminated with non-number character.
0 -5 2 1 p
The product of the two polynomials is
4 1.00 0 -25.00
4
The program exits.
palash@palash-ThinkPad-X1-Yoga-3rd:~$
```

Policy on Plagiarism

Academic integrity is expected from all the students. You should work on the assignment/exam consulting only the material we share with you.

You are required to properly mention/cite anything else you look at. Any student submitting plagiarized code will be penalized heavily. Repeated violators of our policy will be deregistered from the course. Read [this](#) to know what is plagiarism.