SSN College of Engineering, Kalavakkam

Department of Computer Science and Engineering

III Semester - CSE

UCS 1312 Data Structures Lab Laboratory

Academic Year: 2021-2022	**Batch: 2020-2023**

Exercise 1: Polynomial manipulation using Linked List

Create a PolynomialADT with the following fields

Coefficient, Exponent and a pointer to the next node

Polynomial ADT has the implementations for the following operations to

- Create a polynomial through insertion at the end

  void insertEnd(struct polyADT *p, int coeff, int exp)
- Add two polynomials

  polyADT polyAdd(struct polyADT *p1, struct polyADT *p2)
- Multiply two polynomials

  struct polyADT* polyMul(struct polyADT *p1, struct polyADT *p2)
- Simplifying the polynomial – Combining like terms

  polyADT polySimplify(struct polyADT *p)
- Find the degree of polynomial

  void polyDegree(struct polyADT *p)
- Evaluate a polynomial

  int polyEvaluate(struct polyADT *p)

Screenshot of the output:

```
keshav@Keshav:~/data-structure/polynomial$ ./a.out
Polynomial:
Menu
1.Creation
2.Addition
3.Multiplication
4.Simplifying polynomial
5.Degree of polynomial
6.Evaluation of polynomial
7.Quit
Enter any of the options above: 1
Creation of first polynomial:
No.of terms:2

Enter coefficient and exponent: -5 1

Enter coefficient and exponent: -5 0
Creation of second polynomial:
No.of terms:3

Enter coefficient and exponent: 5 2

Enter coefficient and exponent: 4 1

Enter coefficient and exponent: 2 0
-5 x^1 + -5 x^0
5 x^2 + 4 x^1 + 2 x^0
Enter any of the options above: 2
5 x^2 + -1 x^1 + -3 x^0
Enter any of the options above: 3
-25 x^3 + -20 x^2 + -10 x^1 + -25 x^2 + -20 x^1 + -10 x^0
Enter any of the options above: 4
-25 x^3 + -45 x^2 + -30 x^1 + -10 x^0
Enter any of the options above: 5
Input: -25 x^3 + -45 x^2 + -30 x^1 + -10 x^0
Degree of polynomial: 3
Enter any of the options above: 6
-25 x^3 + -45 x^2 + -30 x^1 + -10 x^0

Enter x: 2
Value is: -450
Enter any of the options above: 7
Program ended!
```