**SSN College of Engineering, Kalavakkam**

**Department of Computer Science and Engineering**

**III Semester - CSE**

# UCS 1312 Data Structures Lab Laboratory

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| **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

1. Create a polynomial through insertion at the end

void insertEnd(struct polyADT \*p, int coeff, int exp)

1. Add two polynomials

polyADT polyAdd(struct polyADT \*p1, struct polyADT \*p2)

1. Multiply two polynomials

struct polyADT\* polyMul(struct polyADT \*p1, struct polyADT \*p2)

1. Simplifying the polynomial – Combining like terms

polyADT polySimplify(struct polyADT \*p)

1. Find the degree of polynomial

void polyDegree(struct polyADT \*p)

1. Evaluate a polynomial

int polyEvaluate(struct polyADT \*p)

In order to implement Polynomial Manipulation,

* It is necessary to create a file that has polyADT and implementation of above-mentioned functions
* Another file will be created to write the Polynomial manipulation using the polyADT

**Add the following validations**

During addition, if one of the polynomial is zero polynomial, what will be the result?

During multiplication, if one of the polynomial is zero polynomial, what will be the result?

**Test cases**

1. Creation

1st Polymomial: 5x2+4x+2

2nd Polynomial: -5x-5

1. Addition

1st Number: 5x2+4x+2

2nd Number: -5x-5

Added polynomial: 5x2-x-3

1. Multiplication

1st Polymomial: 5x2+4x+2

2nd Polynomial: -5x-5

Added polynomial: 25x3+20x2+10x-25x2-20x-10

1. Simplifiying the polynomial

25x3-5x2-10x-10

1. Degree of polynomial

Input: 25x3-5x2-10x-10

Degree - 3

1. Evaluation of poylmomial

25x3-5x2-10x-10

X value is 2

Value is 150

**Note: Submit the code along with the output within the deadline**