

Siksha 'O' Anusandhan Deemed to be University
Institute of Technical Education and Research
Data Structure and Algorithms (CSE-2001)

Minor Project May'2020

Programme: B.Tech(All Branches)
Submission deadline 15-05-2020

Semester:2nd
Full marks: 15

Subject/Course Learning Outcome	*Taxonomy Level	Ques. Nos.	Marks
Ability to state and explain the basic programming syntax, semantics, building blocks.	L1	1, 5	4
Ability to develop java programs using programming constructs like conditional statements, looping, array, methods and class.	L3	2, 3, 4	11
Ability to analyze, debug and test the programs and correctly predict their outputs.	L2,L3		
Ability to differentiate the behaviour of different data structures and their memory representations.	L4		
Ability to choose appropriate data structures that efficiently model the problem of interest.	L4		
Ability to apply advanced programming techniques for developing solutions of different problems.	L3		

*Blooms taxonomy levels: Knowledge (L1), Comprehension (L2), Application (L3), Analysis (L4), Evaluation (L5), Creation (L6)

Objective: Given two polynomials, represent them by two linked lists and add these lists.

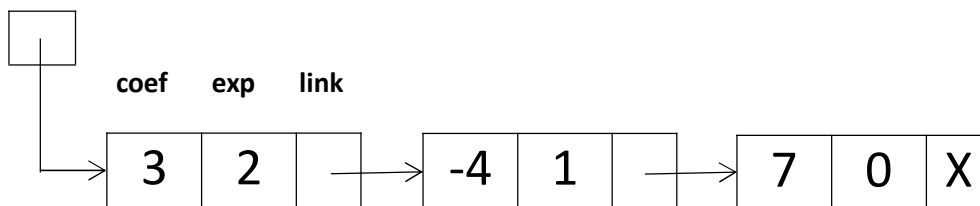
Description:

In mathematics **Polynomial** is a mathematical expression that consists of variables (also called as indeterminate) and coefficients. Polynomial only involves the operations of addition, subtraction, multiplication and non-negative integer exponents of variables.

For example a polynomial of a single indeterminate, x , is: $3x^2 - 4x + 7$.

When a polynomial is represented using a linked list, the coefficients and exponents of the polynomial are defined as the information(info) part of a node. The above polynomial can be represented in a linked list as follows:

start



For adding two polynomials we need to add the coefficients of variables with the same power. For example:

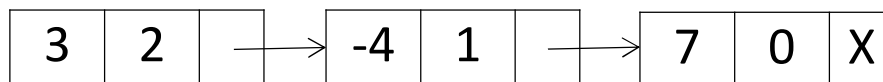
$$1^{\text{st}} \text{ polynomial} = 3x^2 - 4x + 7$$

$$2^{\text{nd}} \text{ polynomial} = 9x + 2$$

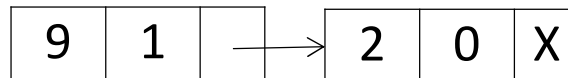
$$\text{Resultant polynomial} = 3x^2 + 5x + 9$$

In linked list representation

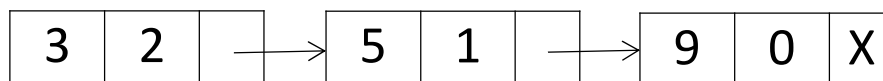
1st polynomial



2nd polynomial



Resultant polynomial



Marks Distribution:

- | | |
|--------------------------|-----|
| 1. Create Node class | [2] |
| 2. Create of polynomials | [3] |
| 3. Display polynomials | [2] |
| 4. Add polynomials | [6] |
| 5. User-interface handle | [2] |

(You can create appropriate classes and add fields, constructors and methods if required.)

*****End*****