Data structures and Algorithms LAB – BSDSF21
(Morning and Afternoon)
Lab 02 – 17-01-2023

You have to create a type (class) **Polynomial** for manipulation of polynomials (n-degree expressions of a variable). The examples of Polynomials $3x^4 - 5x^2 + 4x$, $x^2 - 4x - 4$, and $4x^3 - 5$, etc, etc, with degrees 4,2 and 3 respectively. One way of storage allocation for polynomial of degree **n** is an array size **n + 1**. The array stores the coefficients of the various powers of variable **x** in a systematic way, e.g., $3x^4 - 5x^2 + 4x$ is stored as
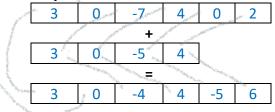
3	0	-5	4	0

Either using class or just functions, you need to implement the Polynomial type. The following functionalities are at least required:

1. createPolynomial(degree) // create empty polynomial with underlying arrays and variable/objects
2. setCoefficient (polynomial, power, coefficient)
3. printPolynomail(polynomial)
4. addPolynomials(polynomial1, polynomial2) // return sum of two polynomials
5. value(polynomial, x) // return value of polynomial for given value of x

Those who understand OOP, should make constructors, __str__, __add__, etc as functions, with first parameter of above functions as __self__. Rest of the student must use their programming fundamentals learning to code this lab.

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Addition of Polynomials

3	0	-7	4	0	2

+

3	0	-5	4

=

3	0	-4	4	-5	6

Printing of a Polynomial

3	0	-5	4

3x^3 - 5x + 4

Value of a Polynomial for x = 3 is 70

3	0	-5	4

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3(3)^3 - 5(3) + 4
3(27) - 15 + 4
81 - 15 + 4
70
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