

311 – Numerical Computations

Lab 3: Introduction to Numerical Computations

Part1:

Write a python program that reads the coefficients and powers of a polynomial (assume they are in decreasing power order).

Remark: Read all the input from a single line and assume no input errors.

The program uses a function to evaluates the polynomial at certain point read from user,

Print final result rounded to two decimal places: `round(result,2)`.

Sample Run:

$$5.5 x^6 - 7 x^4 + x^2 - 8.5$$

Enter the coefficients (real numbers) and powers (integers) of a polynomial (in decreasing power order): 5.5 6 -7 4 1 2 -8.5 0

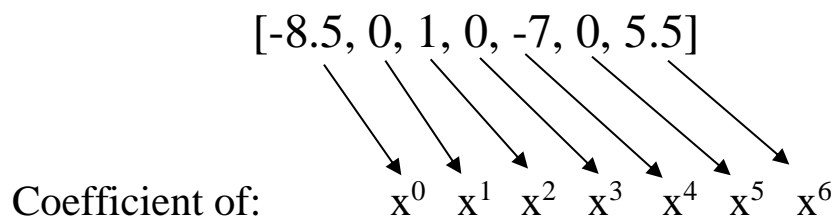
Enter a number: 1.5

The value of the polynomial at 1.5 is 20.96

Part2:**Another Polynomial Representation:**

The Polynomial: $5.5x^6 - 7x^4 + x^2 - 8.5$

Can be represented by coefficients only:



In Lab2, we managed to compute the reverse of an integer without using power computations (**).

In a very similar method, we can evaluate a polynomial (represented in the above representation) without using power computations:

$$a_0 + a_1x + a_2x^2 + a_3x^3 + \cdots + a_nx^n$$

$$= a_0 + x \left(a_1 + x \left(a_2 + x \left(a_3 + \cdots + x (a_{n-1} + x a_n) \cdots \right) \right) \right).$$

Hint: The initial accumulator value is a_n

and the loop starts from a_{n-1} down to a_0

- Write another program that reads a polynomial (in the above representation) and evaluate it using this method.