Episode 7 Homework

1. Exercise

Use the zeros function for the following:

- Initialize an array A1 of rank 1 with size 4 and type double.
- Initialize an array IU of rank 1 with size 4 and type integer.
- Initialize an array M1 of rank 1 with size 4 and type Boolean.

Print each of the arrays you just created.

Initialize a rank-3 array to arbitrary elements.

2. Write a program that evaluates the function

$$f(x) = \frac{1}{\pi(1+x^2)}$$

For 401 values of x equally spaced between -4.0 and 4.0 *inclusive*. Use the linspace function of numpy to generate the x values. Linspace takes a start, an endpoint, and a number of points to generate. By default the endpoint is included. Write a Python function that takes a single value of x and returns the corresponding value of f. It should not print anything.

a. Start off by creating an array f1 of all zeros of the appropriate size. Call your function within a loop to generate each value of f by its index.
b. Pass the entire x array and return it into a variable f2, which will then also be an array of the same size and shape as x. Congratulations, you have written a **ufunc** or *universal function*.