Creating Arrays

1. Ex 1

1. Write a NumPy program to create a 4x4 identity matrix

1000

0100

0010

0001

2. Write a NumPy program to generate a 4x5 matrix of zeros

1. Random
   1. Write a NumPy program to generate an array with 20 random numbers between 0 and 1
   2. Write a NumPy program to generate an array with 20 numbers between 0 and 1, evenly spaced.
   3. Write a NumPy program to generate an array with 20 random integers between 10 and 20
2. Ranges
   1. Write a NumPy program to generate an array with all the **even** numbers between 10 and 20
   2. Write a NumPy program to generate a 2x5 matrix with all the integers between 0 and 9
3. Dimensions

Create a 3D array with dimensions 3x4x2, with random values between 0-1.

For example:

[[[0.246, 0.273],

[0.369, 0.235],

[0.612, 0.636],

[0.157, 0.51 ]],

[[0.347, 0.31 ],

[0.624, 0.672],

[0.628, 0.523],

[0.444, 0.442]],

[[0.643, 0.483],

[0.806, 0.309],

[0.539, 0.797],

[0.251, 0.574]]]

1. Simple Matrices

1. Write a NumPy program to create a 4x4 identity matrix

1000

0100

0010

0001

2. Write a NumPy program to generate a 4x5 matrix of zeros

ראש הטופס

### Accessing Values

1. Ex 1

Preparation

Create a 5x5 matrix with random integers between 50-100

Let's get some data from that matrix!!

* 1. get the last value from the last row
  2. get the second value from third row
  3. get the second and third values from the first row
  4. get the first and forth values from the second last row
  5. get the first 3 values from the 4th row

## Ex 2

Preparation

Create a 5x10 matrix with the numbers 1-50

Let's get some data from that matrix!!

* 1. get the second row
  2. get the first and last rows
  3. get the last 3 rows
  4. get the first 2 values of the first, third and fifth rows
  5. get the second and last values from each row

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### Updating Arrays

1. Ex 1
   * Create a 3x6 matrix of ones.
   * Change the second last row to 2's
   * Change the nested top left 2x2 matrix (top left corner) to zeros
   * Change the 4th and 5th columns to 5's

You should get:

[[0., 0., 1., 5., 5., 1.],

[0., 0., 2., 5., 5., 2.],

[1., 1., 1., 5., 5., 1.]]

## Ex 2

Create a pair matrix, a 3x3x2 array with random values from 1-10.

For example:

[[[10, 8],

[ 6, 3],

[ 9, 6],

[ 4, 2]],

[[ 5, 1],

[10, 9],

[ 5, 2],

[ 8, 6]],

[[ 5, 8],

[ 6, 10],

[ 8, 7],

[ 5, 6]]]

Update all the last values in each cell to be -1.

So now our matrix will look like this:

[[[10, -1],

[ 6, -1],

[ 9, -1],

[ 4, -1]],

[[ 5, -1],

[10, -1],

[ 5, -1],

[ 8, -1]],

[[ 5, -1],

[ 6, -1],

[ 8, -1],

[ 5, -1]]]

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### Extension

1. Swaps

Create a 5x5 matrix with values between 25-49.

* 1. Swap the second and the third columns
  2. Swap the fist and last rows

1. Ex 2

Create a 4x4 matrix with random decimal values between 5-10.

For example:

[[7.029, 8.826, 9.328, 5.835],

[9.602, 6.425, 8.617, 8.988],

[9.592, 6.436, 9.758, 8.362],

[8.415, 8.837, 5.485, 5.235]]

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