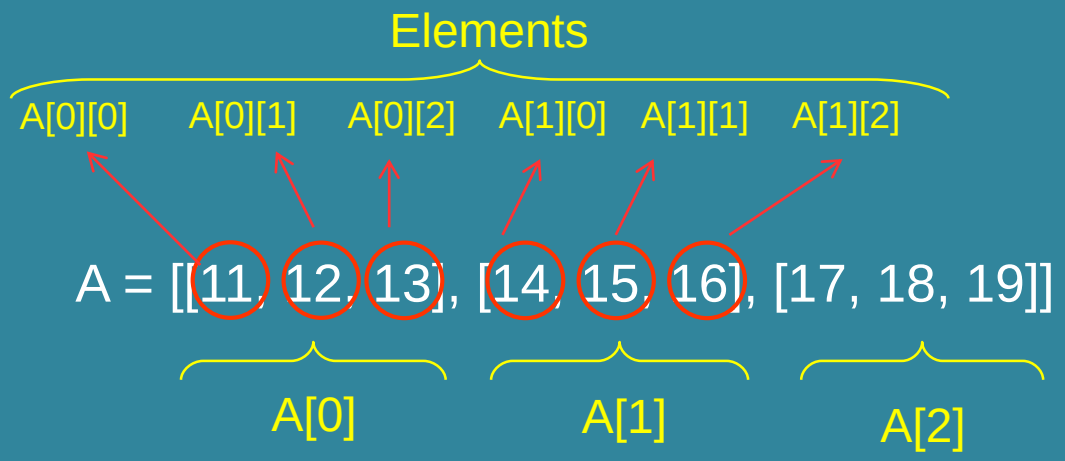
Geo106E
Fundamentals of Programming
Lab-11

2018-2019
Spring Semester

LabWork 11.1
(File name « Lab11.1.py »)

Define a 3 X 3 matrix using numpy array in a list and print the matrix. Here is an example:



$$matrixA = \begin{bmatrix} 11 & 12 & 13 \\ 14 & 15 & 16 \\ 17 & 18 & 19 \end{bmatrix}$$

```
import numpy as np

myList = [[11,12,13],[14,15,16],[17,18,19]]
npList = np.array(myList)
print(npList)
```

LabWork 11.2
(File name « Lab11.2.py »)

Matrix addition and tranpose in numpy library

```
import numpy as np

myList1 = [[11,12,13],[14,15,16],[17,18,19]]
npList1 = np.array(myList1)

myList2 = [[11,12,13],[14,15,16],[17,18,19]]
npList2 = np.array(myList2)

toplam = npList1 + npList2
print(toplam)
```

LabWork 11.3
(File name « Lab11.3.py »)

Matrix multiplication in numpy library

```python
import numpy as np

myList1 = [[11,12,13],[14,15,16],[17,18,19]]
npList1 = np.array(myList1)

myList2 = [[11,12,13],[14,15,16],[17,18,19]]
npList2 = np.array(myList2)

carpim = np.dot(npList1, npList2)
print(carpim)
```

Numpy array

```python
import numpy as np

myList1 = [[11,12,13],[14,15,16],[17,18,19]]
npList1 = np.matrix(myList1)

myList2 = [[11,12,13],[14,15,16],[17,18,19]]
npList2 = np.matrix(myList2)

carpim = npList1 * npList2
print(carpim)
```

Numpy matrix

LabWork 11.4
(File name « Lab11.4.py »)

Read the matrices from txt files and multiply the first matrix with the transpose of second one .Be carefull about the header lines!

```
import numpy as np

matrix = np.genfromtxt("matrix.txt")
```

```
import numpy as np

matrix1 = np.genfromtxt("matrix1.txt", skip_header=3)
matrix2 = np.genfromtxt("matrix2.txt", skip_header=3)
carpim  = np.dot(matrix1, np.transpose(matrix2))
```

LabWork 11.5
(File name « Lab11.5.py »)

Read the matrix3 from matrix3.txt file multiply the matrix with its inverse to find unit matrix.

$$\mathbf{I} = \begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$$

```
import numpy as np

matrix = np.genfromtxt('matrix3.txt')
matrix_inv = np.linalg.inv(matrix)
unitMatrix = np.dot(matrix, matrix_inv)
print(unitMatrix)
```