

## CSE 106 – Lab 2

1. In NumPy, do the following without hardcoding the values into the arrays or using for loops:

- a. Create and print a 4x2 matrix with values ranging from 2 to 10
- b. Create and print a 8x8 matrix and fill it with a checkerboard pattern

```
[[0 1 0 1 0 1 0 1]
```

```
.....
```

```
[0 1 0 1 0 1 0 1]
```

```
[1 0 1 0 1 0 1 0]]
```

- c. Get the unique values of a list

- i. List = [10, 20, 10, 30, 20, 40, 20, 20, 10, 30, 0, 50, 10]

- d. Get the values greater than 37 in the list

- i. List = [6, 75, 9, 82, 36, 42, 59, 3, 52, 1, 32, 68, 93, 4, 27, 85, 0, -3, 57]

- e. Convert the values of a list of values in Centigrade into Fahrenheit degrees

- i. List = [0, 12, 45.21, 34, 99.91]

2. Given the following two matrices, output the results of the operations with NumPy:

$$A = \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix} \quad B = \begin{bmatrix} 3 & 1 & 4 \\ 2 & 6 & 1 \\ 2 & 9 & 7 \end{bmatrix}$$

- a.  $A + B$
- b.  $A \times B$
- c. Determinate of A
- d. Inverse of B
- e. Eigenvalues of A

3. In Pandas, parse the file “weather\_data.txt” and output the answers to the following:

- a. What day(s) had the highest actual precipitation?
- b. What was the average actual max temp for July 2014?
- c. What days was the actual max temp the record max temp?

- d. How much did it rain in October 2014?
  - e. What day(s), if any, was the actual low temperature below 60 degrees and actual max temperature above 90 degrees on the same day?
4. In Pandas, parse the file “weather\_data.txt” and create the following plots (with titles, labels and a legend):
- a. Actual max temperature and actual min temperature on the same line chart (max should be a red line, min should be blue)
  - b. A histogram of actual precipitation