

## Lab 4

### Exception Handling Exercise

- 1) Create a text file and manually add some data to the file
- 2) Write Python code to
  - open the file for write only access
  - attempt to read the contents of the file
- 3) Note the type of Error that has been raised.
- 4) Modify your code to
  - use a try / except / finally construct that will catch the exception, print a user-friendly error message, and clean up the file resource
- 5) Investigate how you would create your own Exception class. Then create your own Exception class and use it in your code from the previous exercise.

### NumPy Exercise 1

- 1) Create an array with the `arange` function and reshape the array as follows:

```
b = arange(24).reshape(2,3,4)
```

This gives us a 3-dimensional data structure – you can think of it as being like 2 spreadsheet sheets where each sheet contains 3 rows of data and each row contains 4 columns.

Using indexing and slicing perform the following tasks:

- i) Choose the first set of 3 rows and 4 columns of data
  - ii) Choose the second row of data from the second set of 3 rows of data
  - iii) Choose all the data from the second column for both the first and second sets of rows and columns of data
- 2) Use the `ravel` function to flatten the data. What's the difference between `ravel` and `flatten`?
  - 3) Reshape the data so that there are 6 rows of 4 columns per row.
  - 4) Get the transpose of the new data structure.
  - 5) Restack the rows of the transposed data structure in reverse order (hint: look at the `row_stack` function).
  - 6) Split the resulting data structure horizontally (hint: look at the `hsplit` function).

## NumPy Exercise 2

### NOTE:

The AAPL.csv contains some stock price data for Apple.

The MSFT.csv contains some stock price data for Microsoft.

- 1) Use the `loadtxt` command to load data from AAPL.csv from columns 5 and 7 (i.e., the close price and the volume).
- 2) Based on the data provided, calculate the volume weighted average price for the stock (i.e., calculate the average price using the volume as weight values).
- 3) Calculate the median value of the closing prices (hint: use the `median` function).
- 4) Calculate the variance value of the closing prices.
- 5) Again, use the `loadtxt` command to load data from columns 3 and 4 (i.e., the high prices and the low prices).
- 6) Use the `max` and `min` functions to get the highest high and the lowest low value.
- 7) Load data from column 5 of AAPL.csv. Also, load data from column 5 of MSFT.csv.
- 8) Calculate the covariance matrix of the closing prices of AAPL and MSFT (hint: use the `cov` function).
- 9) View the values on the diagonal (hint: `diagonal`).
- 10) Calculate the correlation coefficient of the closing prices of AAPL and MSFT (hint: `corrcoef`).

## Regular Expressions Exercise

- 1) Write a Python program that will identify URLs using regular expressions.

## Text Analytics Exercise

- 1) Complete the tutorial at <https://data-flair.training/blogs/nltk-python-tutorial/>