TUTORIAL 4 EXERCISE 2-Sample T-Test

PART 1

A biomaterials engineer has proposed two different topographies for a stent. Each of these two topographies have been investigated for their angiogenesis (blood vessel formation) potential. Angiogenesis activity was measured using a fluorescence-based assays (a.u.) where higher values suggest greater amounts of blood vessel formation.

What is the appropriate statistical test for this data?

Importing relevant libraries!

In [11]:
```
import pandas as pd #library to work with data frames
import numpy as np #library to work with data frames
import matplotlib.pyplot as plt #library to plot figure
import matplotlib.dates as mdates #library for visualization
import seaborn as sns #library to plot figures
import scipy
from scipy import stats
from scipy.stats import t
import statsmodels.api as sm
```

Reading the data and generating plots and descriptive statistics.

In [36]:
```
#Creating dataset
topographyA = np.array([15.8,17.3,15.7,16.9,18.5,17.3,16.5,18.1])
topographyA_df = pd.DataFrame(topographyA)
topographyB = np.array([18.5,19.4,19.3,20.1,19.6,19,18.5,18])
topographyB_df = pd.DataFrame(topographyB)
```

In [ ]:
```

```

PART 2

What assumptions are you making by choosing this test? Justify why they are acceptable.

In [ ]:
```

```

In [ ]:
```

```

PART 3: Provide the 7 steps of the Procedures for Hypothesis Tests

1. Paramater of Interest

2. State the null hypothesis

3. State the null hypothesis

4. Determine appropriate test statistic

5. State the rejection criteria for null hypothesis

6. Computations

7. Draw Conclusions

In [ ]:

PART 4

Use python to validate the hyptheisis test

https://docs.scipy.org/doc/scipy/reference/generated/scipy.stats.ttest_ind.html

stats.ttest_ind(topographyA, topographyB, equal_var=True))

PART 5

Compute the corresponding confidence interval for the difference of means.

In [ ]: