2. Measure of Variability

```
In [1]:
        import numpy as np
         import pandas as pd
         import matplotlib.pyplot as plt
         import seaborn as sns
In [2]: dataset = pd.read_csv('titanic.csv')
In [4]: dataset.head(3)
Out[4]:
                                                     Siblings/Spouses Parents/Children
            Survived Pclass
                                Name
                                          Sex Age
                                                                                          Fare
                                                              Aboard
                                                                               Aboard
                             Mr. Owen
         0
                   0
                          3
                                                                   1
                                 Harris
                                         male 22.0
                                                                                        7.2500
                                Braund
                             Mrs. John
                               Bradley
                              (Florence
                   1
                                        female 38.0
                                                                   1
                                                                                    0 71.2833
                                Briggs
                               Thayer)
                                Cum...
                                 Miss.
         2
                   1
                          3
                                                                   0
                                 Laina female 26.0
                                                                                       7.9250
                             Heikkinen
```

2.1 Range

```
In [8]: min_r = dataset['Age'].min()
    max_r = dataset['Age'].max()

In [9]: min_r, max_r

Out[9]: (0.42, 80.0)

In [10]: range = max_r - min_r

In [11]: range

Out[11]: 79.58
```

2.2 Mean Absolute Division

To simply print graph

```
In [23]: sec_a = np.array([75,65,73,68,72,67])
         sec_b = np.array([90,47,43,96,93,51])
         ne = np.array([1,2,3,4,5,6])
In [36]: mean = np.mean(sec_a)
In [42]: plt.figure(figsize=(10,3))
         plt.scatter(sec_a, ne, color="blue", label="Sec A")
         plt.scatter(sec_b, ne, color="red", label="Sec B")
         plt.plot([70,70,70,70,70], ne, c="green", label="Mean")
         #plt.plot([mean for i in range(1,7)], ne, c="green", label="Mean")
         plt.legend()
         plt.show()
               Sec A
               Sec B
               Mean
        4
        3
        2
        1
                      50
                                    60
                                                  70
                                                                80
```

To use MAD formula

2.3 Calculate Standard Deviation and Variance

Out[55]: (3.559026084010437, 23.18045153428495)

```
In [56]: # To calculate variance of data of section A and section B
np.var(sec_a), np.var(sec_b)
```

So We will take data of section A becuase it has low variance as well as less standard deviation

To calculate std and var on real world data

```
In [58]: dataset = pd.read_csv('titanic.csv')
```

In [60]: dataset.head(3)

Out[60]:

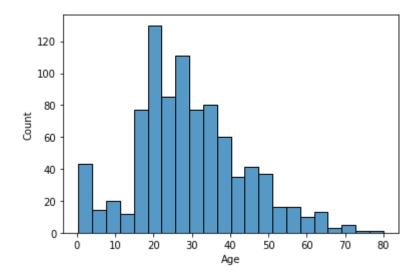
	Survived	Pclass	Name	Sex	Age	Siblings/Spouses Aboard	Parents/Children Aboard	Fare
0	0	3	Mr. Owen Harris Braund	male	22.0	1	0	7.2500
1	1	1	Mrs. John Bradley (Florence Briggs Thayer) Cum	female	38.0	1	0	71.2833
2	1	3	Miss. Laina Heikkinen	female	26.0	0	0	7.9250

```
In [61]: dataset['Age'].var()
Out[61]: 199.42829701227413
```

In [64]: dataset['Age'].std()

Out[64]: 14.12190840546256

```
In [63]: sns.histplot(x='Age', data=dataset)
   plt.show()
```



In [65]: dataset.describe()

Out[65]:

	Survived	Pclass	Age	Siblings/Spouses Aboard	Parents/Children Aboard	Fare
count	887.000000	887.000000	887.000000	887.000000	887.000000	887.00000
mean	0.385569	2.305524	29.471443	0.525366	0.383315	32.30542
std	0.487004	0.836662	14.121908	1.104669	0.807466	49.78204
min	0.000000	1.000000	0.420000	0.000000	0.000000	0.00000
25%	0.000000	2.000000	20.250000	0.000000	0.000000	7.92500
50%	0.000000	3.000000	28.000000	0.000000	0.000000	14.45420
75%	1.000000	3.000000	38.000000	1.000000	0.000000	31.13750
max	1.000000	3.000000	80.000000	8.000000	6.000000	512.32920

In []: