using pandas Data Frame

In [63]:
```
import pandas as pd
a=[1,2,1]
a=pd.DataFrame(a)
d=a.describe()
d
```

Out[63]:

	0
count	3.000000
mean	1.333333
std	0.577350
min	1.000000
25%	1.000000
50%	1.000000
75%	1.500000
max	2.000000

In [64]:
```
v=(d.loc['std'])**2
print(f"mean: {d.loc['mean'][0]},\nstandard Deviation:{d.loc['std'][0]},\nvariance:{v[0]
```

```
mean: 1.3333333333333333,
standard Deviation:0.5773502691896257,
variance:0.3333333333333333
```

Using Numpy Libraries

In [65]:
```
a=[1,2,1]
m=sum(a)/len(a)
n=np.array(a)
v=((n-[m]*len(a))**2).sum()/(len(a)-1)
std=v**.5
print(f"mean: {m},\nstandard Deviation:{std},\nvariance:{v}")
```

```
mean: 1.3333333333333333,
standard Deviation:0.5773502691896257,
variance:0.3333333333333333
```

Without using any Libraries

In [66]:
```
a=[1,2,1]
def standard_deviation(a):
    s=0
    m=sum(a)/len(a)
    for i in a:
        s+=(i-m)**2
    v=s/(len(a)-1)
    std=v**.5
    print(f"mean: {m},\nstandard Deviation:{std},\nvariance:{v}")
```

In [67]:
```
standard_deviation(a)
```

```
mean: 1.3333333333333333,
standard Deviation:0.5773502691896257,
variance:0.3333333333333333
```