In [2]:
```python
import numpy as np
from scipy import stats
from scipy.stats import norm
```

CBA: Practice Problem Set 2

Q No. 3 Answer:

In [3]:
```python
# From question below are the details found;
# n=100, Population mean=50, Pop. SD=40 As no. of samples is > 30
# It follows a normal distribution.
```

In [8]:
```python
# No investigation: P(45<X<55)
# Yes there will be an investigation: 1-P(45<X<55)
```

In [5]:
```python
# To Findout Z-score at x = 45
# z = (sample_mean-Population_mean)/(population_SD/sqrt(n))

z=(45-50)/(40/100**0.5)
z
```

Out[5]: -1.25

In [6]:
```python
# To Findout Z-score at x = 55
# z = (sample_mean-Population_mean)/(population_SD/sqrt(n))

z=(55-50)/(40/100**0.5)
z
```

Out[6]: 1.25

In [7]:
```python
# For No investigation P(45<X<55) using z_scores = P(X<50)-P(X<45)

stats.norm.cdf(1.25)-stats.norm.cdf(-1.25)
```

Out[7]: 0.7887004526662893

```
In [9]: stats.norm.interval(0.7887,loc=50,scale=40/(100**0.5))
```

```
Out[9]: (45.00000495667348, 54.99999504332652)
```

```
In [12]: # Yes there will be an investigation: 1-P(45<X<55)
         1-0.7887
```

```
Out[12]: 0.21130000000000004
```