Assignment-2-Set2-Q5 (Basic Statistic Level-2)

In [1]:
```
import numpy as np
from scipy import stats
from scipy.stats import norm
```

In [2]:
```
# Mean profits from two different divisions of a company = Mean1 + Mean2
Mean = 5+7
print('Mean Profit is Rs', Mean*45,'Million')
```

```
Mean Profit is Rs 540 Million
```

In [3]:
```
# Variance of profits from two different divisions of a company = SD^2 = SD1^2 + SD2^2
SD = np.sqrt((9)+(16))
print('Standard Deviation is Rs', SD*45, 'Million')
```

```
Standard Deviation is Rs 225.0 Million
```

In [4]:
```
# A. Specify a Rupee range (centered on the mean) such that it contains 95% probability for the annual profit of the company.
print('Range is Rs',(stats.norm.interval(0.95,540,225)),'in Millions')
```

```
Range is Rs (99.00810347848784, 980.9918965215122) in Millions
```

In [5]:
```
# B. Specify the 5th percentile of profit (in Rupees) for the company
# To compute 5th Percentile, we use the formula X=μ + Zσ; wherein from z table, 5 percentile = -1.645
X= 540+(-1.645)*(225)
print('5th percentile of profit (in Million Rupees) is',np.round(X,))
```

```
5th percentile of profit (in Million Rupees) is 170.0
```

In [6]:
```
# C. Which of the two divisions has a larger probability of making a loss in a given year?
```

In [7]:
```
# Probability of Division 1 making a loss P(X<0)
stats.norm.cdf(0,5,3)
```

Out[7]:0.0477903522728147

In [8]:
```
# Probability of Division 2 making a loss P(X<0)
stats.norm.cdf(0,7,4)
```

Out[8]:0.040059156863817086

In [ ]: