**Assignment Questions**

Q1. Sample 10000 random number from a normal distribution with mean 5 and variance 5. Compute the probability that of numbers between

1. Mu-sigma and mu+sigma
2. Mu-1.5sigma and mu+1.5sigma
3. Mu-2.4sigma and mu+s2.4igma

**Test Cases:**

Test Case-1:

Input:

100

Output:

0.6833

0.8663

0.9821

Test Case-2:

Input:

90

Output:

Array with random values :

0.6831

0.8701

0.9825

Test Case-3:

Input:

150

Output:

Array with random values :

0.6751

0.8634

0.9869

Q2. Sample the 100, 1000, 10000, 100000 random numbers from a normal distribution with mean 5 and variance 49. Now convert all the four different samples into standard normal distribution. Further, Computer the mean and standard deviation of the four given samples.

**Test Cases:**

Test Case-1:

Input:

100

Output:

Mean with 100: -0.0000

Std Deviation with 100: 1.0000

Mean with 1000: -0.0000

Std Deviation with 1000: 1.0000

Mean with 10000: 0.0000

Std Deviation with 10000: 1.0000

Mean with 100000: 0.0000

Std Deviation with 100000: 1.0000

Test Case-2:

Input:

90

Output:

Mean with 100: 0.0000

Std Deviation with 100: 1.0000

Mean with 1000: -0.0000

Std Deviation with 1000: 1.0000

Mean with 10000: -0.0000

Std Deviation with 10000: 1.0000

Mean with 100000: 0.0000

Std Deviation with 100000: 1.0000

Test Case-3:

Input:

150

Output:

Mean with 100: -0.0000

Std Deviation with 100: 1.0000

Mean with 1000: -0.0000

Std Deviation with 1000: 1.0000

Mean with 10000: 0.0000

Std Deviation with 10000: 1.0000

Mean with 100000: 0.0000

Std Deviation with 100000: 1.0000

Q3. Rocky, Johny, Geeta and Babita gave exams in different boards. Rocky secured 80 out of 100 in CBSE, Johny secured 75 in the UP Board, Geeta got 68 in Bihar board, Babita got 88 in Haryana Board. The mean and deviation for CBSE was 70 and 15 respectively, while 64 and 12 for UP Board, 65 and 6 for Bihar board, 77 and 11 for Haryana Board. Which student do you think performed better? Assume that the distribution of marks follows normal behavior.

**Test Cases:**

Output:

Z-Score for Rocky: 0.67

Z-Score for Johny: 0.92

Z-Score for Geeta: 0.50

Z-Score for Babita: 1.00

Babita performed Best