

Assignment 3

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Download all python codes from

[https://github.com/pranav-159/
ai1103_Probability_and_Random_variables/
blob/main/Assignment_3/codes/
experimental_verification_gate46.py](https://github.com/pranav-159/ai1103_Probability_and_Random_variables/blob/main/Assignment_3/codes/experimental_verification_gate46.py)

and latex-tikz codes from

[https://github.com/pranav-159/
ai1103_Probability_and_Random_variables/
blob/main/Assignment_3/Assignment3.tex](https://github.com/pranav-159/ai1103_Probability_and_Random_variables/blob/main/Assignment_3/Assignment3.tex)

1 PROBLEM(GATE46)

Consider the random process

$$X(t) = U + Vt,$$

where U is a zero-mean Gaussian random variable and V is a random variable distributed between 0 and 2. Assume that U and V are statistically independent. The mean value of the random process at t=2 is.....

2 SOLUTION(GATE46)

Here U is a gaussian random variable of mean 0 and Let us consider V is uniformly distributed random variable in (0, 2).

Random Variable	U	V	X(t)
Expected Value	0	1	t

$$E[X(t)] = E[U + Vt] \quad (2.0.1)$$

$$E[X(2)] = E[U + 2V] \quad (2.0.2)$$

$$E[X(2)] = E[U] + 2E[V] \quad (2.0.3)$$

$$E[X(2)] = 0 + 2 \quad (2.0.4)$$

$$E[X(2)] = 2 \quad (2.0.5)$$

∴ mean of random process X(t) at 2 is 2.