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

and latex-tikz codes from

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

TABLE 0: Random Variables and Expected Values

Using table 0 we can deduce that,

$$E[X(t)] = E[U + Vt] \tag{2.0.1}$$
$$E[X(t)] = E[U] + tE[V] \tag{2.0.2}$$
$$E[X(t)] = 0 + t \tag{2.0.3}$$
$$E[X(t)] = t \tag{2.0.4}$$
$$E[X(2)] = 2 \tag{2.0.5}$$

$\therefore$ mean of random process X(t) at 2 is 2.