



SNS COLLEGE OF TECHNOLOGY

(An Autonomous Institution)

Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai

Accredited by NAAC-UGC with 'A++' Grade (Cycle III) &

Accredited by NBA (B.E - CSE, EEE, ECE, Mech & B.Tech.IT)

COIMBATORE-641 035, TAMIL NADU



PUZZLE -3

Classification of Random Processes

Puzzle 1:

You are monitoring the temperature in a city every second for a day. Is this an example of a continuous random process, a discrete random process, a continuous random sequence, or a discrete random sequence? Explain your reasoning^{[1][2][3][4]}.

Puzzle 2:

Each hour, you count the number of phone calls received at a call center. What type of random process does this describe? Justify your answer^{[1][5][2][3]}.

Puzzle 3:

A machine records the voltage in a circuit at exactly 10 distinct times during a test. The voltage can take any value. How would you classify this process^[3]?

Stationary and Wide-Sense Stationary Processes

Puzzle 4:

A weather station records the daily high temperature at the same location for a year. Do you expect this process to be stationary or non-stationary? Why^{[3][6]}?

Puzzle 5:

A lottery machine produces a random number every minute. The way the machine works does not change over time. Is this process stationary or non-stationary? Explain your answer^{[3][6]}.

Puzzle 6:

You observe a process where the average value and variability do not change, no matter when you start observing. What kind of stationarity does this process have^[6]?



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Markov Processes and Markov Chains

Puzzle 7:

You are playing a board game where your next move depends only on your current position, not on how you got there. What kind of process does this describe^{[1][7]}?

Puzzle 8:

A robot moves through rooms in a building. The probability that it enters a specific room next depends only on its current room. Is this a Markov process or not? Why^{[1][7]}?

Puzzle 9:

A student can be in one of three moods each day: happy, neutral, or sad. The mood tomorrow depends only on today's mood, not on previous days. What is this process called^{[1][7]}?

Advanced Applications

Puzzle 10:

In a factory, a machine can be either working or broken each day. The chance it is working tomorrow depends only on whether it is working today. What type of random process is this? How would you represent the possible states and transitions^{[1][7]}?

These puzzles use real-life scenarios to test your understanding of random process classification, stationarity, and Markov properties—without requiring any equations.

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1. <https://www.jeppiaarinstitute.org/pdf/lectures/703.pdf>



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2. <https://ece.poriyaan.in/topic/introduction-of-random-processes-20305/>
3. <https://www.ece.uvic.ca/~mmcguire/teaching/e400/Lecture14.pdf>
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5. <https://grt.edu.in/wp-content/uploads/2022/04/MA8451-PRP-NOTES.pdf>
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7. https://webstor.srmist.edu.in/web_assets/srm_mainsite/files/2018/RandomProcess-Unit-3.pdf