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YEARS ANNIVERSARY

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Applied Statistics and Experimental Design

Data Analysis and Experimental Design

TITLE AND CONTENT SLIDE

- Data Analysis Procedure

VI. Data analysis procedure

- Data analysis procedure
 - Data collecting
 - Receive data
 - Convert interested process using equipments
 - Using sensors to receive temporary electrical values
 - Data preparation:
 - Convert data into more suitable forms for processing.
 - Identify and delete abnormal or distorted data
 - A/D conversion
 - Sampling and quantization

VI. Data analysis procedure

- Estimation of important properties of data
 - Testing for stationary
 - Testing for periodicity of data: delta form of spectral density of the process.
 - Testing for normality of the process: using χ^2 criteria.
- Data analysis
 - Analysis sample functions in separation
 - Analysis ensemble of sample functions with known statistical properties of each realization

VI. Data analysis procedure

- Analysis of sample function in separation
 - Estimation of mean and mean square
 - Estimation of covariance function
 - Estimation of spectral density
 - Estimation of probability density
 - Analysis of nonstationary and transitional processes
 - Analysis of periodic and almost periodic processes

VI. Data analysis procedure

- Analysis of sample functions in ensemble
 - Analysis of sample function in separation
 - Test for correlation between sample functions
 - Test for equivalence of uncorrelated sample functions
 - Union of equivalent uncorrelated sample functions.
 - Estimation of mutual covariance function
 - Estimation of coherent function
 - Estimation of frequency properties
 - Test for equivalence of spectrums

Midterm test

- Problem 1: A pair of dice is tossed twice. What is the probability of getting totals of 7 and 11.
- Problem 2: A pack consists of 36 cards. Three cards are drawn. What is the probability that one card is ace?
- Problem 3: In a assembly plant, three machine A, B, C make 30%, 45% and 25% respectively of products. It is known that 2%, 3% and 2% of the product made by each machine respectively are defective. Suppose that a finished product is randomly selected. What is the probability that it is defective ? If a product were chosen randomly and found to be defective, what is the probability that it was made by machine C ?
- Problem4: Given distribution function $F(t)$. Find:
 - $P\{T=5\}$; $P\{T > 3\}$; $P\{1.4 < T < 6\}$
- Problem 5: A continuous random variable X that can assume values between $x=1$ and $x=3$ has a density function given by $f(x)=1/2$.
 - Show that, the area under the curve is equal to 1.
 - Find $P\{2 < X < 2.5\}$
 - Find $P\{X \leq 1.6\}$

$$F(t) = \begin{cases} 0, & t < 1 \\ \frac{1}{4}, & 1 \leq t < 3 \\ \frac{1}{2}, & 3 \leq t < 5 \\ \frac{3}{4}, & 5 \leq t < 7 \\ 1, & t \geq 7 \end{cases}$$



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**Thank you for
your attentions!**



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