GEBZE TEKNİK ÜNİVERSİTESİ
ELEKTRONİK MÜHENDİSLİĞİ

ELM218
Probability and Randomness
Spring 2020
Instructor:Assist.Prof.Önder Şuvak

BONUS HW-Week#4
Questions and Answers

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Bonus HW – WEEK #4

1- Look up what mean median and Cumulant are for a random variable

Median → In probability theory, the median is the value separating the higher half from the lower half of a data sample, a population or a probability distribution.

Cumulant → In probability theory, the cumulants κ_n of a probability distribution are a set of quantities that provide an alternative to the moments of the distribution. The moments determine the cumulants in the sense that any two probability distributions whose moments are identical will have identical cumulants as well, and similarly the cumulants determine the moments.

→ $A = \{X_1, X_2 \dots X_n\}$ → A is set of some random

if $X_1 < X_2 < X_3 \dots < X_n$ then Median = $X'_{\frac{n-1}{2}+1}$

2- What is deterministic value. How is it different from a random variable

→ If the outcome of a variable is fixed, i.e. if a variable will always have the exact same value, we call this a deterministic variable.

A random variable is a variable, which may take a range of numerical outcomes as the value is a result of a random phenomenon.

3- Does any moment of the Bernoulli-Random Variable turn out to be equal in value to the probability of success, P?

Expected value of Bernoulli random variable

$E[X] = 0 \cdot (1-P) + 1 \cdot P = P$ //

$q = P\{X=0\} = P\{\text{failure}\}$

$p = P\{X=1\} = P\{\text{success}\}$

the game ends at the bernoulli trial with this index	probability of the corresponding event
1	$P = P\{X_1=1\}$
2	$q \cdot P = P\{X_1=0, X_2=1\}$
3	$q^2 p$
4	$q^3 p$
5	$q^4 p$
⋮	⋮

k dereede

$P \overset{?}{=} q^{k-1} p$ eşitliğinin gerçeklese-bilmesi için $k=1$ yani başarısız hiçbir durum olmaması ilk adımda başarılması gerekdidir.