10/10 Excellent

Birziet University

STAT2371 Fall 2021-2022 Dr. Hassan Abu hassan Quiz # 2

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Consider a binomial experiment with n= 10, p = 0.2

a) **Compute the probability of one success (P(1))**

$P(x) = \binom{n}{x} \cdot p^x \cdot (1-p)^{n-x}$

$P(1) = \binom{10}{1} \cdot (0.2)^1 \cdot (1-0.2)^{(10-1)}$

$10 \cdot 0.2 \cdot (0.8)^9$

$= 10 \cdot 0.2 \cdot 0.1342$

$P(1) = 0.2684$

b) **Compute the probability of two success (P(2))**

$P(2) = \binom{10}{2} \cdot 0.2^2 \cdot (1-0.2)^{(10-2)}$

$= 45 \cdot 0.04 \cdot 0.0677 = P(2) = 0.3018$

c) **Compute the probability of no success (P(0))**

$P(0) = \binom{10}{0} \cdot 0.2^0 \cdot (1-0.2)^{10-0}$

$1 : 1 \cdot 0.1073$

$P(0) = 0.1073$

d) **Compute the probability of at least three success**

$(P(X) \geq 3) = (1 - P(X) < 3) = 1 - [P(2) + P(1) + P(0)]$

$= 1 - [0.3018 + 0.2684 + 0.1073]$

$= 1 - 0.6775$

$= 0.3225$

e) **Compute the expected value E(X)**

$e(x) = n \cdot p$

$= 10 \cdot 0.2 = e(x) = 2$

f) **Compute the variance value V(X)**

$V(x) = n \cdot p \cdot (1-p)$

$= 2 \cdot (1-0.2) = 2 \cdot 0.8$

$V(x) = 1.6$

g) **Compute the standard deviation of X**

$= \sqrt{V} = \sqrt{1.6} = 1.264$

h) **What does X represent?**

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i) **Is X discrete or continuous?**

discrete