



Assignment - III

Ques: 1 → Assume that the probability of a defective computer component is 0.02. Components are randomly selected. Find the probability that the first defect is caused by the seventh components tested. How many components do you expect to test until one is found to be defective?

Ques: 2 → The lifetime risk of developing pancreatic cancer is about one in 78 (1.28%). Let X = the number of people you ask before one says he or she has pancreatic cancer. The random variable X in this case includes only the number of trials that were failure and does not count the trial that was a success in finding a person who had the disease. The appropriate formula for this random variable is the second one presented above. Then X is a discrete random variable with a geometric distribution: $X \sim G\left(\frac{1}{78}\right)$ or $X \sim G(0.0128)$.

Ques: 3 → A baseball player has a batting average of 0.320. This is the general probability that he gets a hit each time he is at bat.

What is the probability that he gets his first hit in the third trip to bat?



Ques. 4: → There is an 80% chance that a Dalmatian dog has 13 black spots. You go to a dog shop and count the dots on Dalmatians. What is the probability that you will review the spots on 3 dogs before you find one that has 13 black spots?

Ques. 5: → The first four moments of a distribution about the value of 2 of the variable are 1, 16 and -40 respectively. Find the value of the first three moments about the origin.

Ques. 6: → In a certain distribution, the first four moments about the point $x = 4$ are -1.5, 17, -30 and 308. Find the moment about mean and about origin. Also, Calculate β_1 and β_2 .

Ques. 7: → The first four moments of a distribution about the value '4' of the variable are -1.5, 17, -30 and 108. Find the moment about mean, about origin, β_1 and β_2 . Also, find the moment about the point $x = 2$.

Ques. 8: → Find the moment generating function of the discrete poisson distribution given by $P(x) = e^{-\lambda} \cdot \frac{\lambda^x}{x!}$. Also find the first & second moment about the mean.



- Ques. 9: Find the moment generating function of the continuous normal distribution given by $f(x) = \frac{1}{\sigma\sqrt{2\pi}} e^{-\frac{1}{2\sigma^2}(x-\mu)^2}$; $-\infty < x < \infty$.
- Ques. 10 You draw cards ~~from~~ ^{from} a deck (with replacement) until you get four aces. What is the chance that you will draw exactly 20 times?
- Ques. 11 Each year the Akron Arduarks have a 10% chance of winning the trophy in chinchilla grooming. Their trophy case has space for five trophies. Let Y be the number of year until their case is full. Find the Mean and standard deviation of Y .
- Ques. 12 10% of applicants for a job possess the right skills. A company has three positions to fill, and they interview applicants one at a time until they fill all three positions.

(a) What is the probability that they will interview exactly 10 Applicants?

(b) What is the probability that they will interview at least 10 Applicants?

Ques 13 The company from Ques. 12, takes three hours to Interview an unqualified applicant and five hours to interview a qualified applicant. Calculate the Mean & Standard deviation of the time to conduct all the interview.

Ques 14 You roll a die until you get four sixes (not necessarily consecutive). What is the Mean and standard deviation of the number of rolls you will make?