Review

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Jack plays pong against some computer program, he wins with probability 0.70, loses with probability 0.10, and 20% of the games result is a draw. Assume independence.

- Find the probability that Jack's first win happens when he plays his second game.
- Find the probability that Jack fifth win happens when he plays his eighth game.
- Find the probability that Jack wins 7 games, if he plays 10 games.
- Jack plays 10 games. Find the probability that he wins 5 games, loses 1 games, and draws 4 games.
- Jack plays 10 games. Find the probability that Jack wins at least 3 games.

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$$Geometric(p = 0.7),\ P(X = 2)$$

- Find the probability that Jack fifth win happens when he plays his eighth game.

$$NegativeBinomial(p = 0.7, r = 5),\ P(X = 8)$$

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Distributions

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- Find the probability that Jack wins 7 games, if he plays 10 games.

$$Binomial(n = 10, p = 0.7),\ P(X = 7)$$

- Jack plays 10 games. Find the probability that Jack wins at least 3 games.

$$Binomial(n = 10, p = 0.7),\ P(X \geq 3)$$

- Jack plays 10 games. Find the probability that he wins 5 games, loses 1 games, and draws 4 games.

$$Multinomial : \frac{10!}{5!1!4!} 0.7^5 0.1^1 0.2^4$$

Suppose we have 49 data points with sample mean 6.25 and sample variance 36. The data is drawn from normal distribution. We want to test whether $\mu = 4$ at $\alpha = 0.05$.

Suppose we run a two-sample t-test for equal means with significance level $\alpha = 0.05$. If the data implies we should reject the null hypothesis, then the odds that the two samples come from distributions with the same mean are
A. 19/1 B. 1/19 C. 20/1 D. 1/20 E. unknown