

(1) On average there is 1 car crash per week. What is the probability that there will be at most 2 car crashes in the next month?

$$\textit{Poisson} : \mathbb{P}(X \leq 2) = e^{-4}(1 + 4 + 16/4) = 13e^{-4} \approx 0.2381$$

(2) Let X be the number of coin tosses until the tail appears once. Find $\mathbb{P}(X > 2)$

$$\textit{Geometric} : \mathbb{P}(X > 2) = 1 - 1/2 - 1/4 = 1/4$$

(3) Let Y be the number of coin tosses until the tail appears twice. Find $\mathbb{P}(Y > 2)$

$$\textit{Negative binomial} : \mathbb{P}(X > 2) = 1 - 1/4 = 3/4$$

(4) Find $\mathbb{P}(Y=4)$

$$\textit{Negative binomial} : \mathbb{P}(X = 4) = \binom{3}{1} (1-p)^2 p^2 = 3/16$$

End of the quiz