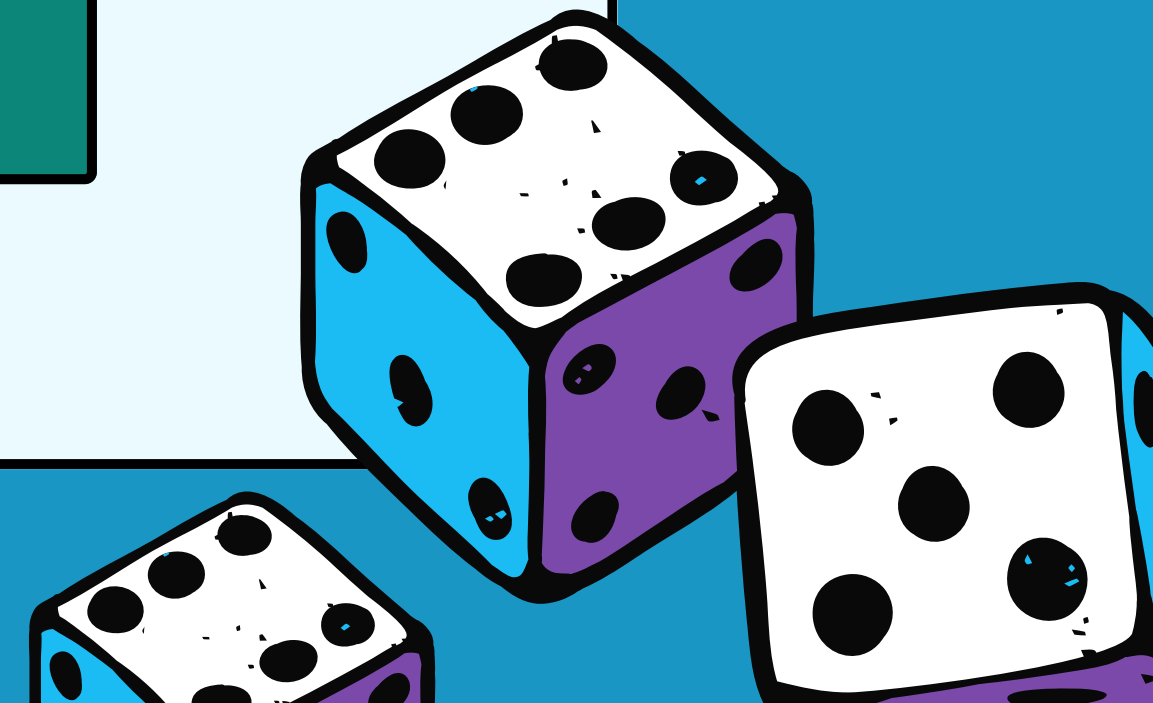
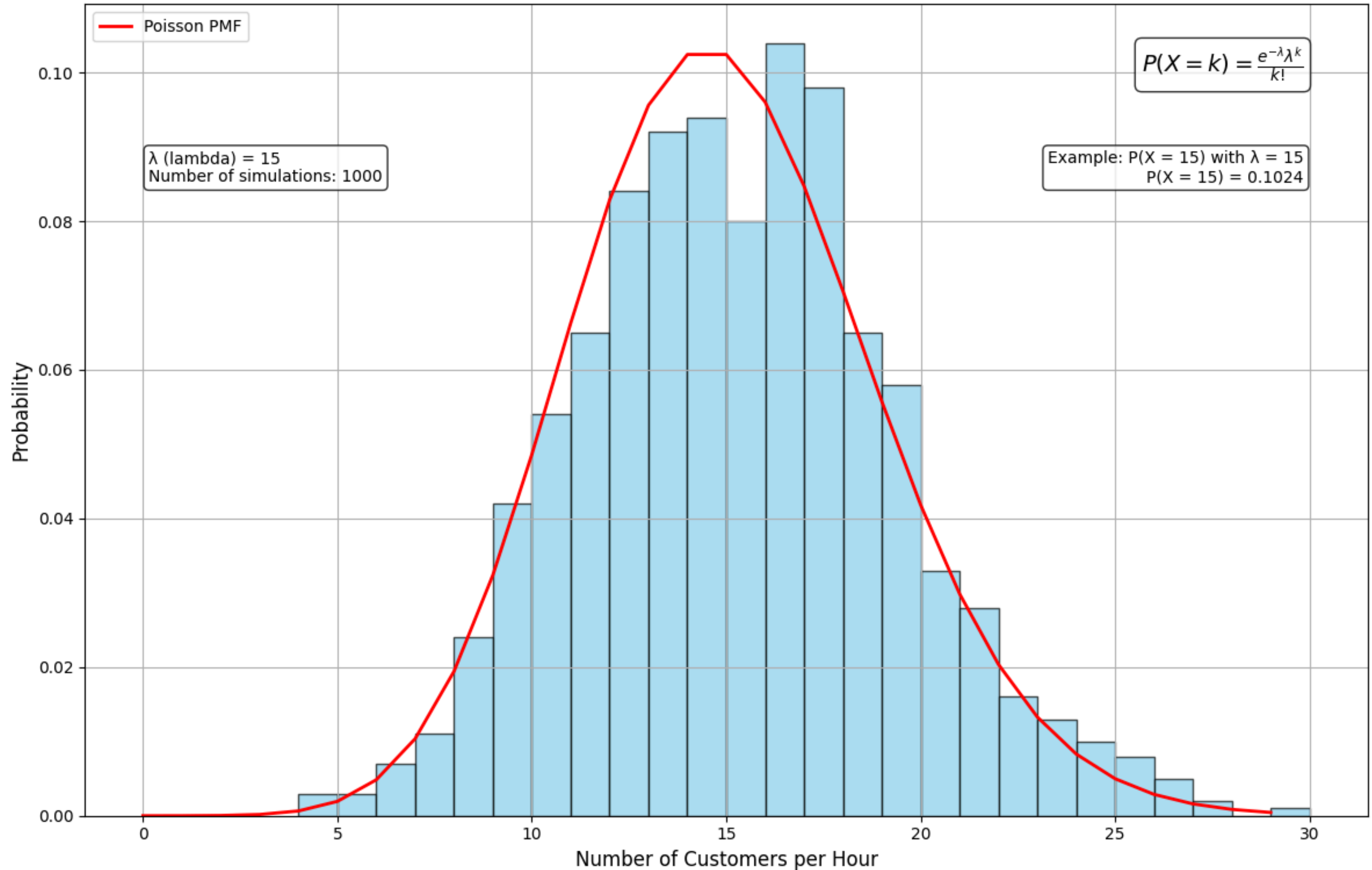


Poisson Distribution

ML Group 4 Probability Task



Poisson Distribution: Coffee Shop Customer Arrivals



Plot Distribution in x-y

Poisson Distribution Formula

$$P(X = k) = (e^{-\lambda} * \lambda^k) / k!$$

where:

- $P(X = k)$ is the probability of k occurrences
- e is Euler's number (approximately 2.71828)
- λ (lambda) is the average number of occurrences per interval
- k is the number of events we're calculating the probability for
- $k!$ is the factorial of k



Formula Example

Example: $P(X = 15)$ with $\lambda = 15$

The formula for the Poisson probability is:

$$P(X = k) = (e^{(-\lambda)} * \lambda^k) / k!$$

Given $\lambda = 15$ and $k = 15$:

$$P(X = 15) = (e^{(-15)} * 15^{15}) / 15!$$

The probability $P(X=15)$ with $\lambda=15$ is approximately 0.1024

Interpretation: If an event occurs on average 15 times in a given interval (e.g., time, space), there's about a 10.24% chance that you'll observe exactly 15 events happening during that interval

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