**BASICS STATS AND PROBABILITY**

**POISSON**

When the Poisson probability on a set of events approaches 1, it means that the likelihood of those events occurring is very high or almost certain.

1. **In the context of a Poisson distribution, as the average number of events (λ) increases, the Poisson probability of observing a particular number of events approaches 1.**

**Specifically:**

1. \*\*Probability of at least one event\*\*: As λ increases, the probability of observing at least one event (P(X ≥ 1)) approaches 1.

- For example, if λ = 10, the probability of observing at least one event is P(X ≥ 1) = 1 - e^(-10) ≈ 0.9999, which is very close to 1.

2. \*\*Probability of a specific number of events\*\*: As λ increases, the Poisson probability of observing a specific number of events (P(X = x)) also approaches 1, but for a larger value of x.

- For example, if λ = 100, the probability of observing exactly 100 events is P(X = 100) = e^(-100) \* (100^100) / 100! ≈ 0.0818, which is still relatively high.

3. \*\*Probability of exceeding a specific number of events\*\*: As λ increases, the probability of observing a number of events greater than or equal to a specific value (P(X ≥ x)) approaches 1, again for a larger value of x.

- For example, if λ = 1000, the probability of observing at least 950 events is P(X ≥ 950) ≈ 0.9999, which is very close to 1.

In summary, when the Poisson parameter λ (the average number of events) is large, the Poisson probability of observing events approaches 1, indicating that the occurrence of those events is almost certain or highly likely.

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