Sri Lanka Institute of Information

Technology



Lab Submission

Lab sheet No 06

**IT24101896**

**Abeywickrama J B**

**Probability and Statistics | IT2120**

B.Sc. (Hons) in Information Technology

Exercise

1. An IT company claims that their newly developed learning platform improves student performance in online tests. According to previous data, 85% of students who used the platform passed their online tests. A batch of 50 students is selected at random who have completed the course using this platform. Let X denote the number of students who passed the test out of 50 students.

i. What is the distribution of X?

* X = number of students (out of 50) who passed.
* Each student has two outcomes (pass/fail).
* Probability of success (pass) = 0.85.
* Number of trials = 50.

X∼Binomial(n=50,p=0.85)

ii. What is the probability that at least 47 students passed the test?

P(X≥47)=P(X=47)+P(X=48)+P(X=49)+P(X=50)

P(X≥47)≈0.04605(4.6%)

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2. A call center receives an average of 12 customer calls per hour.

i. What is the random variable (X) for the problem?

* X= number of calls received by the call center in one hour.

ii. What is the distribution of X?

* Calls follow a Poisson distribution with average rate λ = 12 calls/hour
* X∼Poisson(λ=12)

iii. What is the probability that exactly 15 calls are received in an hour?

P(X=15) = e^ (-12) \* 12^ 15 / 15!

P(X=15) ≈ 0.07239

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