Sri Lanka Institute of Information Technology

Lab Submission
Lab sheet No 6

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IT2120 - Probability and Statistics

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?

```
Binomial(50, 0.85)
```

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

```
P(X >= 47) = 0.04604658
```

```
40 # ------------------------------
41 # Exercise
42 # Question 1
43 # 1
44 # binomial Distribution
45 # here random variable x has binomial distribution with n=50 and p=0.85
46
47 # 2
48 # at least 47 student passed the test p(x>=47)
49 pbinom(46, 50, 0.85,  lower.tail = FALSE)
50 1-pbinom(46, 50, 0.85,  lower.tail = TRUE)
51
```

```
> # 2
> # at least 47 student passed the test p(x>=47)
> pbinom(46, 50, 0.85,  lower.tail = FALSE)
[1] 0.04604658
> 1-pbinom(46, 50, 0.85,  lower.tail = TRUE)
[1] 0.04604658
```

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

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

number of receives calls in per hour.

ii. What is the distribution of X?

Poisson(lambda = 12)

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

P(X = 15) = 0.07239112

```
52  # Question 2
53  # 1
54  # number of receives call in per hour
55
56  # 2
57  # poisson distribution
58  # here random variable x has poisson distribution with lambda = 12
59
60  # 3
61  # p(x=15)
62  dpois(15, 12)
```

```
> # 3
> # p(x=15)
> dpois(15, 12)
[1] 0.07239112
>
>
```