

Lab Sheet 06

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 ?

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> # Question 1 - Part i  
> #  $X \sim \text{Binomial}(n = 50, p = 0.85)$ 
```

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

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> # Question 1 - Part ii  
> 1 - pbinom(46, 50, 0.85)  
[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?

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> # Question 2 - Part i  
> #  $X = \text{Number of customer calls received in an hour}$ 
```

ii. What is the distribution of X ?

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> # Question 2 - Part ii  
> #  $X \sim \text{Poisson}(\lambda = 12)$ 
```

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

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> # Question 2 - Part iii  
> dpois(15, 12)  
[1] 0.07239112
```