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.

```
> setwd ("C:\\Users\\nayan\\OneDrive\\Desktop\\IT24201016_Lab_6")
```

```
> n <- 50
> p <- 0.85
> X_distribution <- "Binomial(n = 50, p = 0.85)"
> cat("Distribution of X:", X_distribution, "\n")
Distribution of X: Binomial(n = 50, p = 0.85)
```

```
> probability_at_least_47 <- 1 - pbinom(46, n, p)
> cat("Probability that at least 47 students passed:", probability_at_least_47, "\n")
Probability that at least 47 students passed: 0.04604658
```

i. What is the distribution of X?

Binomial distribution

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

cumulative distribution function (CDF)

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

```
> lambda <- 12
> X_distribution_call_center <- "Poisson(lambda = 12)"
> cat("Distribution of X:", X_distribution_call_center, "\n")
Distribution of X: Poisson(lambda = 12)
> probability_exactly_15 <- dpois(15, lambda)
> cat("Probability that exactly 15 calls are received:", probability_exactly_15, "\n")
Probability that exactly 15 calls are received: 0.07239112
```

i. What is the random variable (X) for the problem?
Let- X is the number of customer calls received in an hour.

ii. What is the distribution of X?

Poisson distribution(Lamda=12)

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

probability mass function (PMF)