

IT2120 - Probability and Statistics

Lab Sheet 06

IT24101020

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Exercise 01

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##Question 01
#Part 1
#Binomial Distribution
#Here, random variable x has binomial distribution with n=50 and p=0.85
#X ~ Binomial(n = 50, p = 0.85)

#Part 2
#It asks to find  $P(X \geq 47)$ . This can be calculated using "pbinom" command as follows.
#You need to rearrange the probability statement as follows.
# $P(X \geq 47) = 1 - P(X \leq 46)$ 
#Then command will be as follows:
1 - pbinom(46, 50, 0.85, lower.tail = TRUE)

#Or else, following command can also be used by keeping argument "lower.tail" as "FALSE".
#Here, when that argument is "FALSE", it means that  $P(X > 46)$ , which is same as  $P(X \geq 47)$ .
pbinom(46, 50, 0.85, lower.tail = FALSE)
```

```
> ##Question 01
> #Part 1
> #Binomial Distribution
> #Here, random variable x has binomial distribution with n=50 and p=0.85
> #X ~ Binomial(n = 50, p = 0.85)
> #Part 2
> #It asks to find  $P(X \geq 47)$ . This can be calculated using "pbinom" command as follows.
> #You need to rearrange the probability statement as follows.
> # $P(X \geq 47) = 1 - P(X \leq 46)$ 
> #Then command will be as follows:
> 1 - pbinom(46, 50, 0.85, lower.tail = TRUE)
[1] 0.04604658
> #Or else, following command can also be used by keeping argument "lower.tail" as "FALSE".
> #Here, when that argument is "FALSE", it means that  $P(X > 46)$ , which is same as  $P(X \geq 47)$ .
> pbinom(46, 50, 0.85, lower.tail = FALSE)
```

Exercise 02

```
79 ##Question 02
80 #Part 1
81 #Random variable X is the number of customer calls received in one hour.
82
83
84 #Part 2
85 #Poisson distribution
86 #Here, random variable X has poisson distribution with lambda = 12
87 #X ~ Poisson(lambda = 12)
88
89
90 #Part 3
91 #It asks to find P(X = 15). Following command gives the density.
92 #In other words, probability of getting an exact value can be calculated using "dpois" command.
93 dpois(15, 12)
```

```
> ##Question 02
> #Part 1
> #Random variable X is the number of customer calls received in one hour.
> #Part 2
> #Poisson distribution
> #Here, random variable X has poisson distribution with lambda = 12
> #X ~ Poisson(lambda = 12)
> #Part 3
> #It asks to find P(X = 15). Following command gives the density.
> #In other words, probability of getting an exact value can be calculated using "dpois" command.
> dpois(15, 12)
[1] 0.07239112
> |
```