IT2120 - Probability and Statistics

Lab Sheet 06

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Excersice 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 >= 47). This can be calculated using "pbinom" command as follows.
#You need to rearrange the probability statement as follows.
#P(X >= 47) = 1 - P(X <= 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 >= 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 >= 47). This can be calculated using "pbinom" command as follows.
> #You need to rearrange the probability statement as follows.
> #P(X >= 47) = 1 - P(X <= 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 >= 47).
> pbinom(46, 50, 0.85, lower.tail = FALSE)
```

Excersice 02

```
##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)
```

```
> ##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
>
```