SESSION 8: Exploratory Data Analytics

Assignment 3

1. A recent national study showed that approximately 44.7% of college students have used Wikipedia as a source in at least one of their term papers. Let X equal the number of students in a random sample of size n = 31 who have used Wikipedia as a source.

   Perform the below operations:

   siz = 31 *# size n = 31*

   pb = 44.7/100 *# 44.7% of college students*

   #the above 2 variables are constant for the below operations

   A. Find the probability that X is equal to 17

   Answer:

   x = 17

   dbinom(x,size = siz,prob = pb)

   Output:

```
> x = 17
> dbinom(x,size = siz,prob = pb)
[1] 0.07532248
```

   B. Find the probability that X is at most 13

   Answer:

   x = 13

   pbinom(x,size = siz,prob = pb)

   Output:

```
> x = 13
> pbinom(x,size = siz,prob = pb)
[1] 0.451357
```

   C. Find the probability that X is bigger than 11.

   Answer:

   x = 11

   pbinom(x,size = siz,prob = pb,lower.tail = F)

   Output:

```
> x = 11
> pbinom(x,size = siz,prob = pb,lower.tail = F)
[1] 0.8020339
```

   D. Find the probability that X is at least 15.

   Answer:

   x = 15

   pbinom(x,size = siz,prob = pb,lower.tail = F)

   Output:

```
> x = 15
> pbinom(x,size = siz,prob = pb,lower.tail = F)
[1] 0.2753716
```

E. Find the probability that X is between 16 and 19, inclusive

Answer:

```
x = c(16:19) #X is between 16 and 19
sum(dbinom(x,size = siz,prob = pb))

#we can achieve the above same result by doing this below
x = c(19,15)
diff(pbinom(x,size = siz,prob = pb,lower.tail = F))
```

Output:

```
> x = c(16:19) #X is between 16 and 19
> sum(dbinom(x,size = siz,prob = pb))
[1] 0.2544758
>
> #we can achive the above #E's same result by doing this below
> x = c(19,15)
> diff(pbinom(x,size = siz,prob = pb,lower.tail = F))
[1] 0.2544758
```