Assignment3_18230445

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Q1: Calculating probabilities that all 10 flights were on time

```
dbinom(x=10, size=10, prob=0.75)
```

```
## [1] 0.05631351
```

Q1: Calculating the probablities that 7 to 9 flights were on time

```
sum(dbinom(7:9, size = 10, prob=0.75))
```

```
## [1] 0.7195616
```

Q2: Probability that fewer than 10 of the 50 sampled invoices receive the discount?

```
sum(dbinom(0:9, size = 50, prob=0.1))
```

```
## [1] 0.9754621
```

Q2: Mean of the most likely number of discounts that company will have to offer.

```
mn = 50 * 0.1

mn
```

```
## [1] 5
```

Q2: The standard deviation and use of Chebyshev's inequality to provide a range of values that likely account for

75% of discounts the firm.

```
sdev = sqrt(50 * 0.1 * 0.9)
print(sdev)
```

```
## [1] 2.12132
```

```r
Lower_Bound = mn - (2*sdev)
Upper_Bound = mn + (2*sdev)
cat ("The range lies between",Lower_Bound,"and",Upper_Bound)
```

```
## The range lies between 0.7573593 and 9.242641
```

POISSON DISTRIBUTION

Q1 : probability that 3 cars arrive in a given second

```r
dpois(x=3, lambda=3)
```

```
## [1] 0.2240418
```

Q2 : Probability that more than 3 cars arrive in a given second

```r
c = sum(dpois(0:3, lambda=3))

res = 1 - c
print(res)
```

```
## [1] 0.3527681
```

Q3 : Probability that 5 messages are received in a given minute

```r
dpois(x=5, lambda=4)
```

```
## [1] 0.1562935
```

Q3 : Probability that 9 messages are received in 1.5 minutes

```r
dpois(x=9, lambda=4*1.5)
```

```
## [1] 0.06883849
```

Q3 : Probability that fewer than 3 messages are received in 30 seconds

```r
sum(dpois(0:2, lambda=4 * (30/60)))
```

```
## [1] 0.6766764
```