Lab Assignment-2

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Q1.

CODE:

```r
# a)
x<-c(rep("Gold",20),rep("Silver",30),rep("Bronze",50))
sample(x, 10)

# b)
y<-c("Success","Failure")
z<-c(0.9,0.1)
sample(y,10,replace=TRUE,prob=z)
```

OUTPUT:

```
> sample(x, 10)
 [1] "Gold"   "Silver" "Bronze" "Silver" "Silver" "Silver" "Gold"   "Silver" "Silver"
[10] "Gold"
> sample(y,10,replace=TRUE,prob=z)
 [1] "Success" "Success" "Success" "Success" "Success" "Success" "Success" "Success"
 [9] "Success" "Success"
```

Q2.

CODE:

```r
# a)
n=as.integer(readline("Enter the number of people:"))
print(pbirthday(n, classes=365,coincident=2))

# b)
print(qbirthday(prob=0.5, classes=365,coincident=2))
```

OUTPUT:

```
Enter the number of people:23
[1] 0.5072972
[1] 23
```

Q3.

CODE:

```r
bayesTheorem = function(cloudy, rainy, clouds_given_rainy){
  rain_given_cloudy<-(clouds_given_rainy*rainy)/cloudy
  return(rain_given_cloudy)
}
cloudy<-0.4
rainy<-0.2
clouds_given_rainy<-0.85
print(bayesTheorem(cloudy, rainy, clouds_given_rainy))
```

OUTPUT:

```
> source("~/Desktop/Thapar/5th SEM/PS/Exp2/Exp2-3.R")
[1] 0.425
```

Q4.

CODE:

```r
dir.create(path = "data")
dir.create(path = "output")

# a)
head(iris)

# b)
str(iris)

# c)
range(iris$Sepal.Length)

# d)
mean(iris$Sepal.Length)

# e)
median(iris$Sepal.Length)

# f)
quantile(iris$Sepal.Length, probs=c(0.25, 0.75))
IQR(iris$Sepal.Length)

# g)
sd(iris$Sepal.Length)
var(iris$Sepal.Length)

# i)
summary(iris)
```

OUTPUT:

```
> head(iris)
  Sepal.Length Sepal.Width Petal.Length Petal.Width Species
1          5.1         3.5          1.4         0.2  setosa
2          4.9         3.0          1.4         0.2  setosa
3          4.7         3.2          1.3         0.2  setosa
4          4.6         3.1          1.5         0.2  setosa
5          5.0         3.6          1.4         0.2  setosa
6          5.4         3.9          1.7         0.4  setosa
> str(iris)
'data.frame':	150 obs. of  5 variables:
 $ Sepal.Length: num  5.1 4.9 4.7 4.6 5 5.4 4.6 5 4.4 4.9 ...
 $ Sepal.Width : num  3.5 3 3.2 3.1 3.6 3.9 3.4 3.4 2.9 3.1 ...
 $ Petal.Length: num  1.4 1.4 1.3 1.5 1.4 1.7 1.4 1.5 1.4 1.5 ...
 $ Petal.Width : num  0.2 0.2 0.2 0.2 0.2 0.4 0.3 0.2 0.2 0.1 ...
 $ Species     : Factor w/ 3 levels "setosa","versicolor",..: 1 1 1 1 1 1 1 1 1 1 ...
> range(iris$Sepal.Length)
[1] 4.3 7.9
> mean(iris$Sepal.Length)
[1] 5.843333
> median(iris$Sepal.Length)
[1] 5.8
```

```
> quantile(iris$Sepal.Length, probs=c(0.25, 0.75))
25% 75%
5.1 6.4
> IQR(iris$Sepal.Length)
[1] 1.3
> sd(iris$Sepal.Length)
[1] 0.8280661
> var(iris$Sepal.Length)
[1] 0.6856935
> summary(iris)
  Sepal.Length    Sepal.Width     Petal.Length    Petal.Width          Species  
 Min.   :4.300   Min.   :2.000   Min.   :1.000   Min.   :0.100   setosa    :50  
 1st Qu.:5.100   1st Qu.:2.800   1st Qu.:1.600   1st Qu.:0.300   versicolor:50  
 Median :5.800   Median :3.000   Median :4.350   Median :1.300   virginica :50  
 Mean   :5.843   Mean   :3.057   Mean   :3.758   Mean   :1.199                  
 3rd Qu.:6.400   3rd Qu.:3.300   3rd Qu.:5.100   3rd Qu.:1.800                  
 Max.   :7.900   Max.   :4.400   Max.   :6.900   Max.   :2.500                  
```

Q5.

CODE:

```
x<-c(1,1,2,3,4)
my_mode<-function(x) {
  unique_x<-unique(x)
  tabulate_x<-tabulate(match(x, unique_x))
  unique_x[tabulate_x==max(tabulate_x)]
}
my_mode(x)
```

OUTPUT:

```
> my_mode(x)
[1] 1
```