

Assignment1

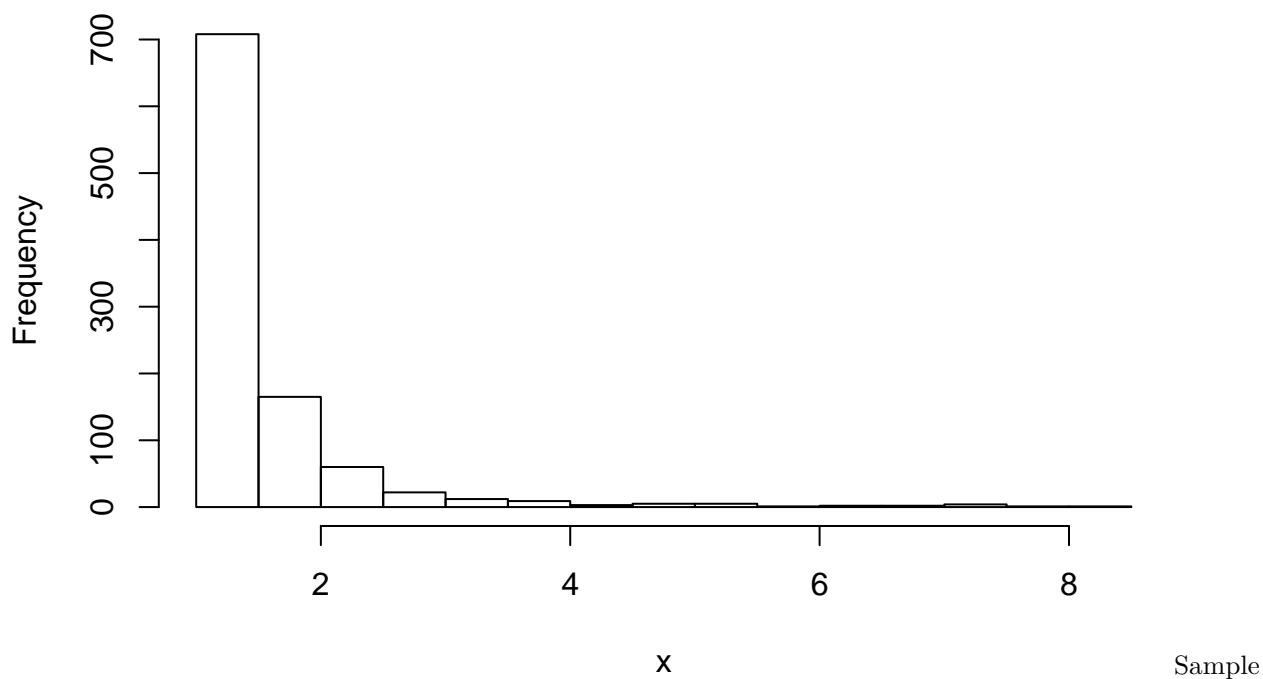
Sangamesh

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Q.1

Calculating the Sample mean and draw it's histogram:

Histogram of x



mean of X is:

```
## [1] 1.520057
```

Calculating Expected value of the distribution:

Expected value of X is:

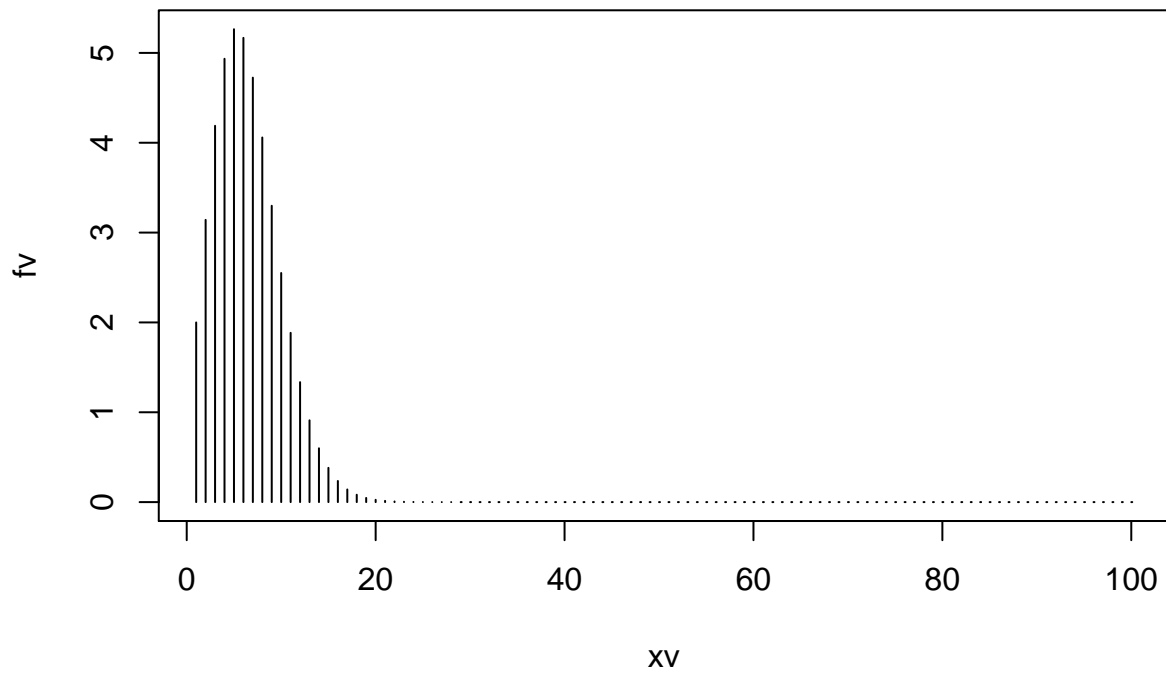
```
## 1.5 with absolute error < 1.7e-14
```

Difference between sample mean and expected value of X is:

```
## [1] 0.0200574
```

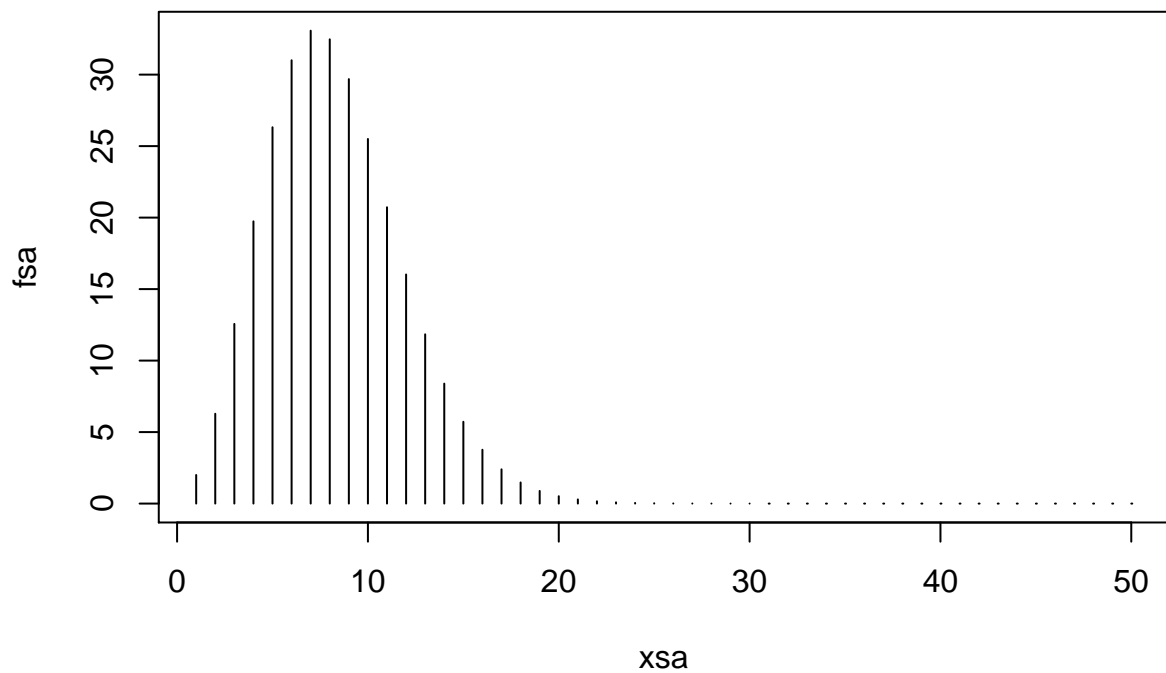
Inference : The difference between the sample mean and expected value is nearly 0.

Q.2



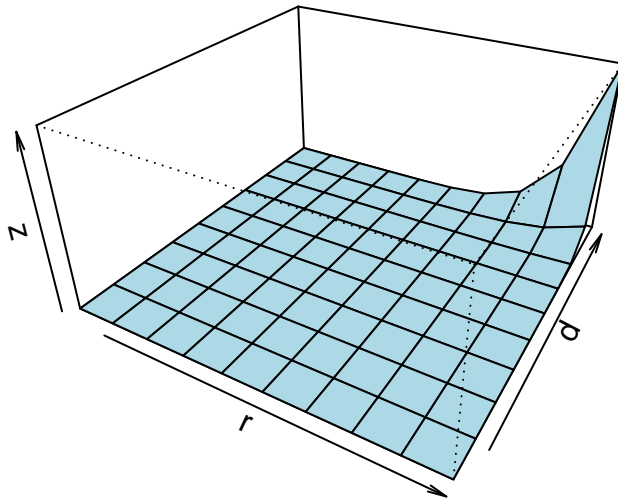
Observation: if the limit as d goes to infinity, the volume of the ball goes to zero.

Q.3



Observation: if the limit as d goes to infinity, the surface area of the ball goes to zero.

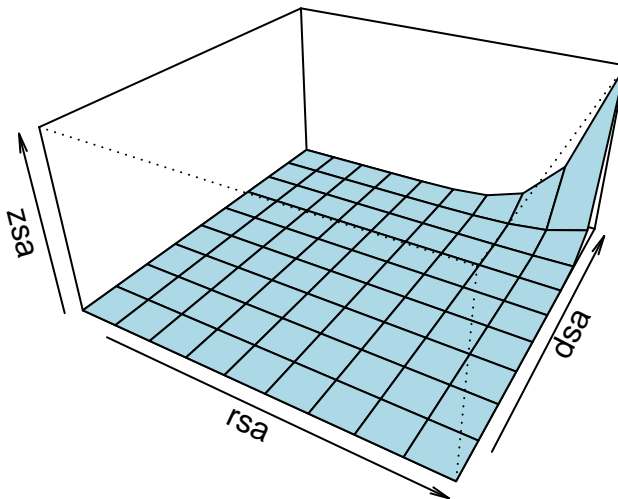
Q.4



the volume of the ball goes to zero.

Observation: if the limit as d and r goes to infinity,

Q.5



the surface area of the ball goes to zero.

Observation: if the limit as d and r goes to infinity,

Q.6

The differences in euclidean distances for the subspace projection is as follows:

```
## [1] "Subspace of dimension: 1"
## [1] 42.60812
## [1] "Subspace of dimension: 2"
## [1] 60.23224
## [1] "Subspace of dimension: 3"
## [1] 68.91104
## [1] "Subspace of dimension: 4"
## [1] 78.90893
```

```
## [1] "Subspace of dimension: 5"  
## [1] 86.57676  
  
## [1] "Subspace of dimension: 10"  
## [1] 110.6487
```

Observation : As we decrease the dimension, the differences in euclidean distances for the subspace projection decreases.