STATS202A – HW 1

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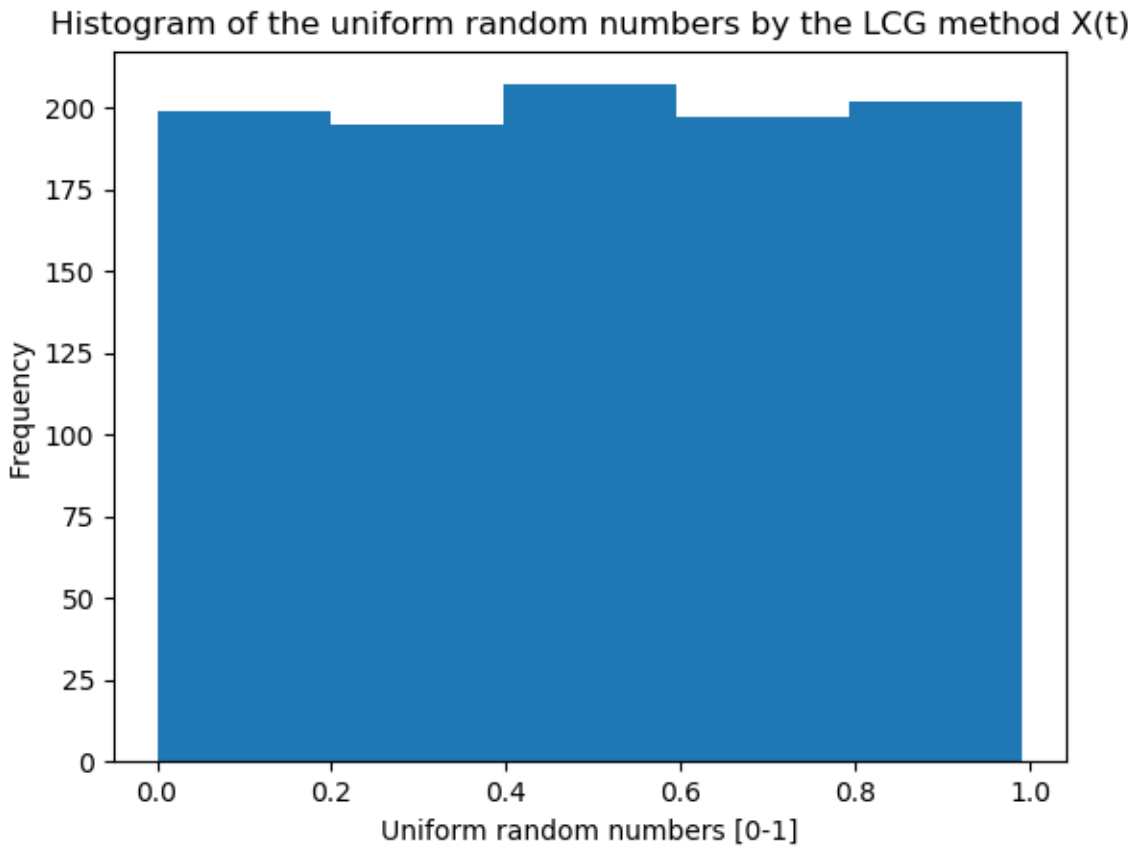
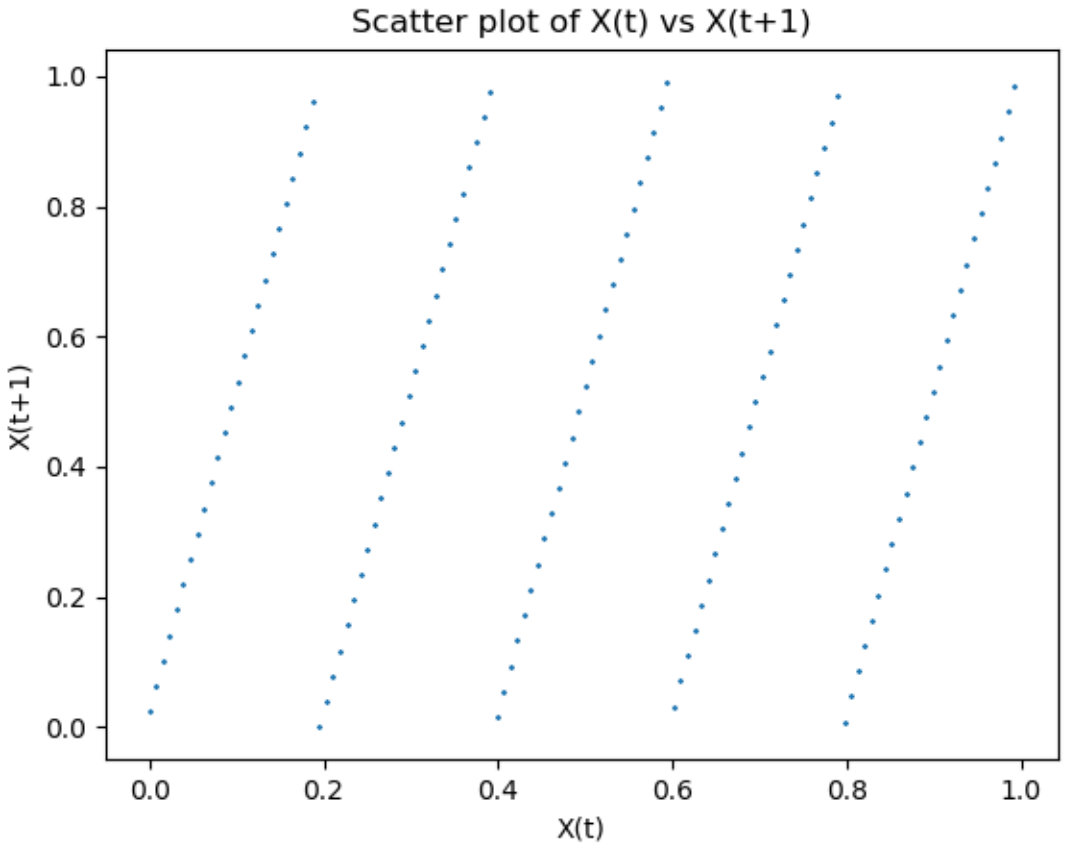
Python –

2.a) The uniform random numbers were generated with the parameters:

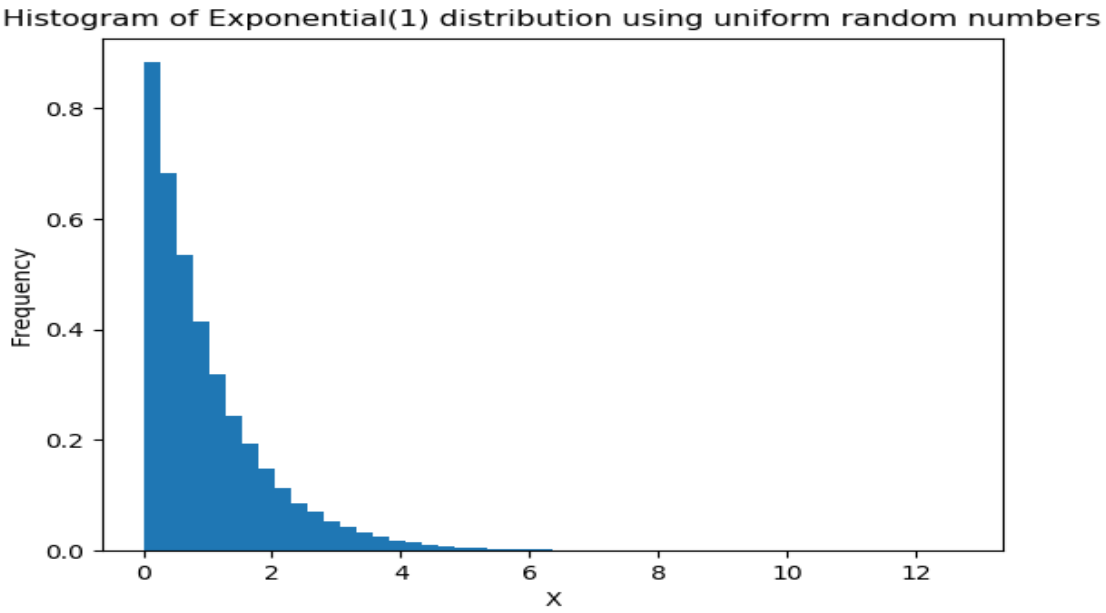
Seed (X0) = 0, a(multiplier) = 5, b(adder) = 3, m = 128, N(number of samples) = 1000



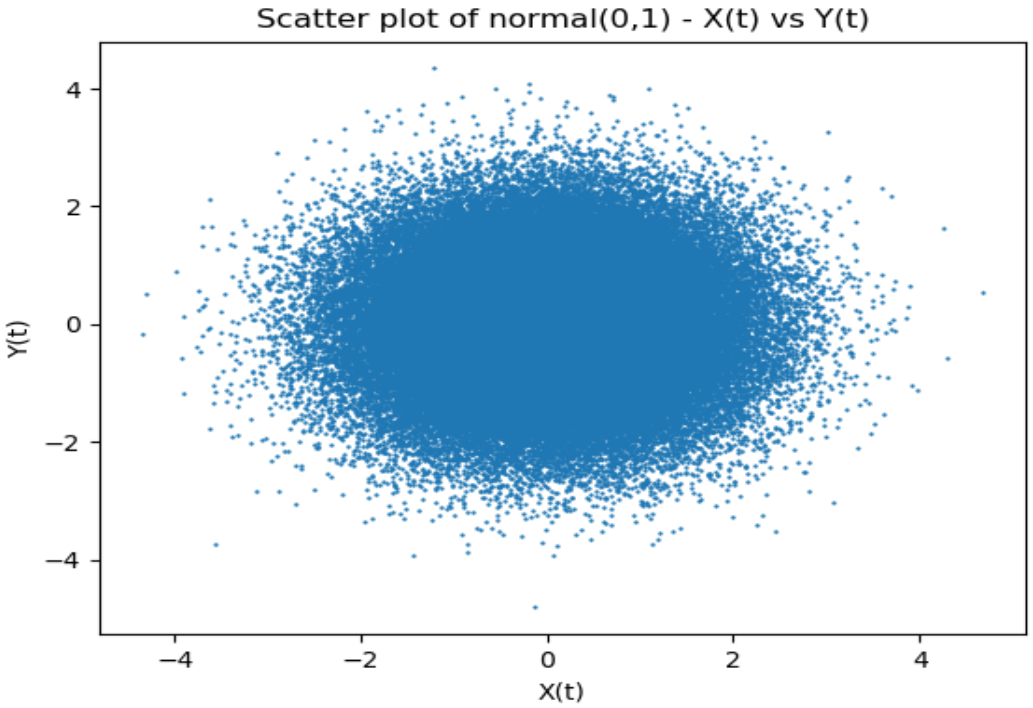
Below is the scatter plot of X(t) vs X(t+1). We can see that values are uniformly covered in the interval [0,1].



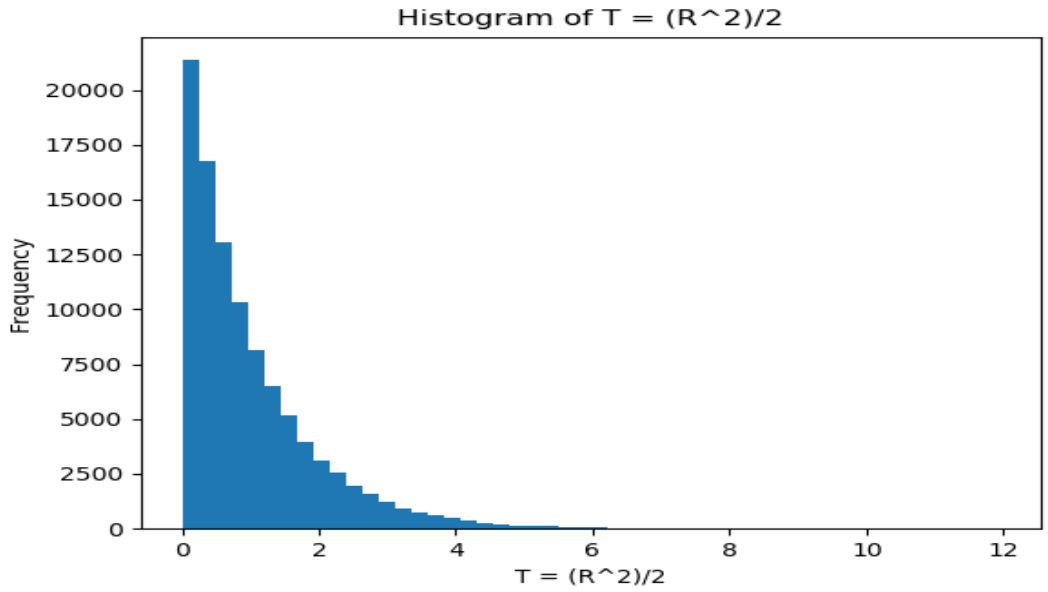
2. b) Histogram of the exponential distribution where lambda = 1 using uniform random numbers generated.



2. c) Scatter plot of N(0,1) on the X and Y axes built using uniform random numbers generated.



Histogram of T = R^2/2 where this follows a exponential distribution.



3) Below are the results obtained for Monte Carlo computation:

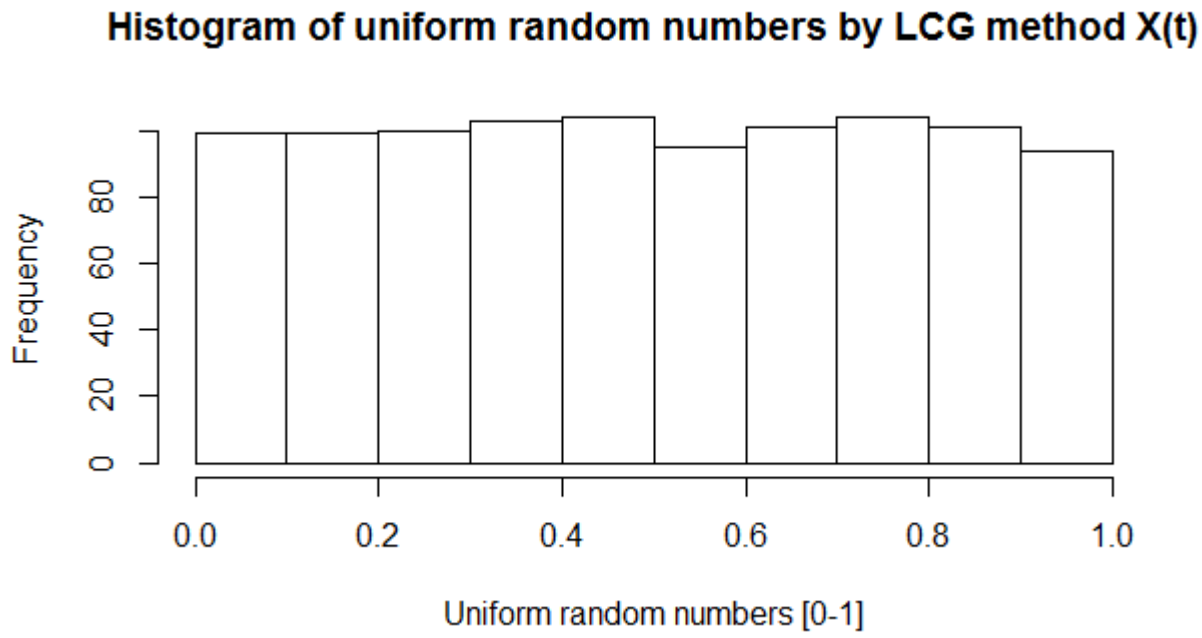
```
Estimated value of pi =  3.14496
Estimated volume of 5 dimensional unit ball is  5.32256
Estimated volume of 10 dimensional unit ball is  2.58048
>>>
```

Ln: 151 Col: 4

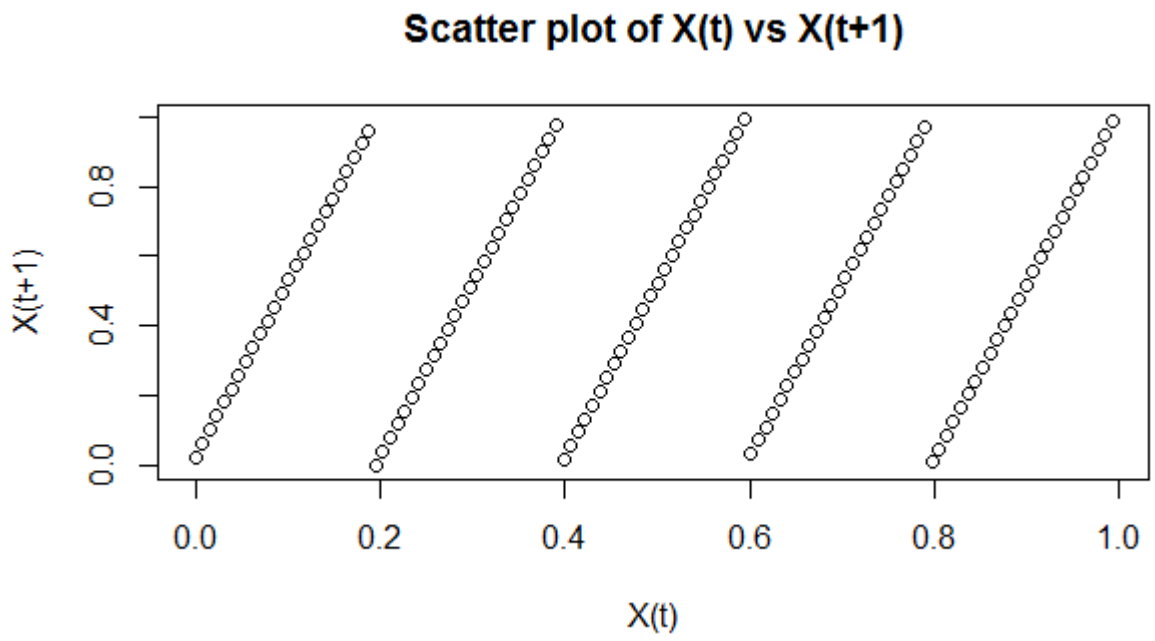
R -

2.a) The uniform random numbers were generated with the parameters:

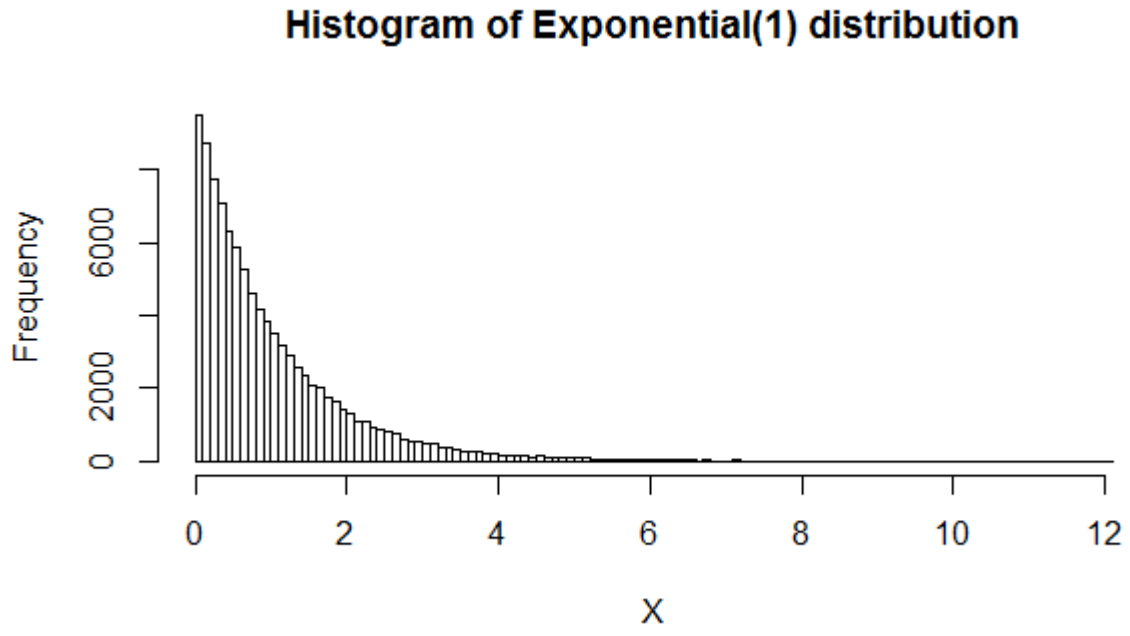
Seed (X0) = 0, a(multiplier) = 5, b(adder) = 3, m = 128, N(number of samples) = 1000



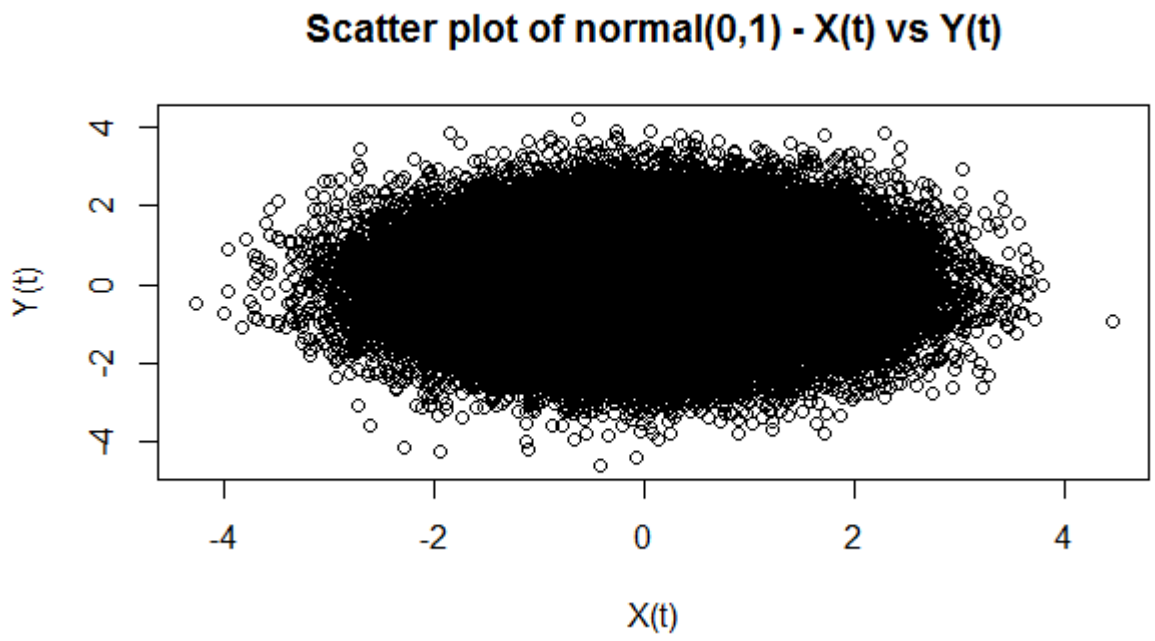
Below is the scatter plot of X(t) vs X(t+1). We can see that values are uniformly covered in the interval [0,1].



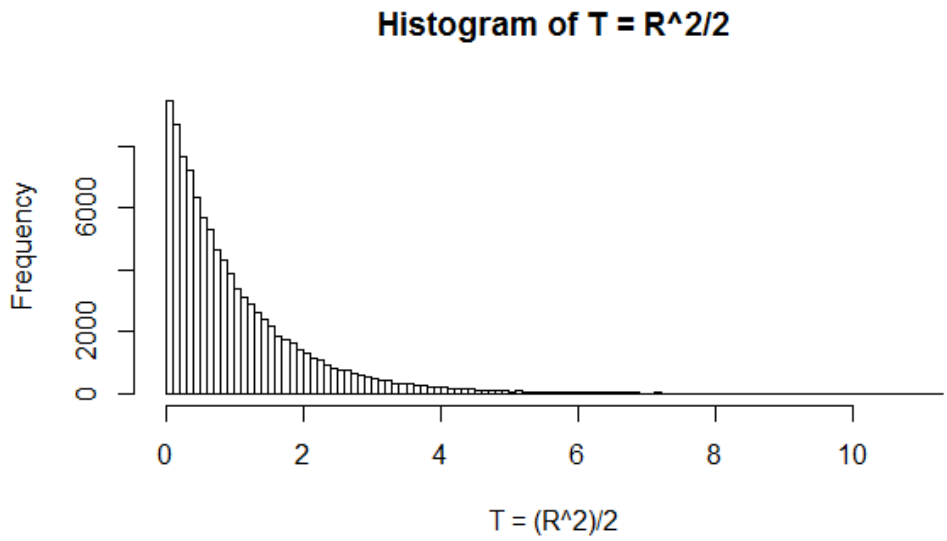
2. b) Histogram of the exponential distribution where lambda = 1 using uniform random numbers generated.



2. c) Scatter plot of N(0,1) on the X and Y axes built using uniform random numbers generated.



Histogram of T = R^2/2 where this follows a exponential distribution.



3) Below are the results obtained for Monte Carlo computation:

```
[1] "Estimated value of pi =  3.14376"
[1] "Estimated volume of 5 dimensional unit ball is  5.25504"
[1] "Estimated volume of 10 dimensional unit ball is  2.34496"
> 
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