Assignment 1 - Computer Simulation

Ajay Tharwani (ED13B005)

Generating 2 exponentially distributed random variables

```
Y1<-(-log(runif(1000)))
Y2<-(-log(runif(1000)))

U<-runif(1000)
```

Initializing target density

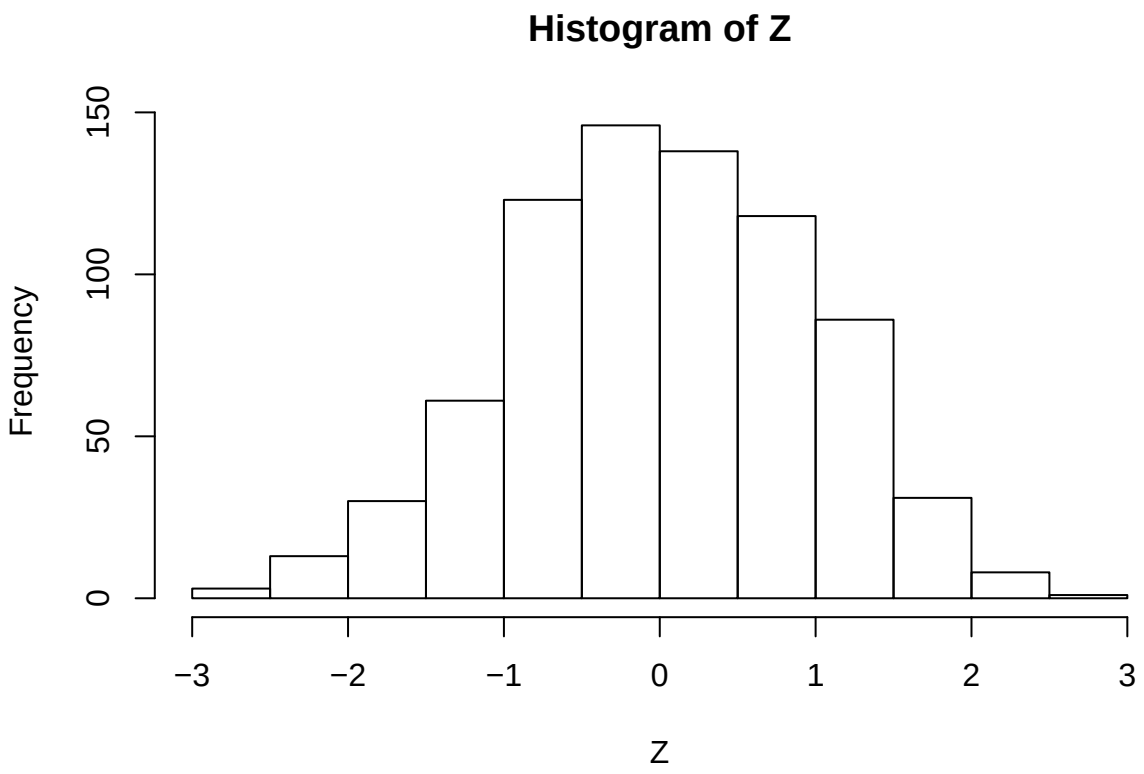
```
Z<-c()
```

Algorithm

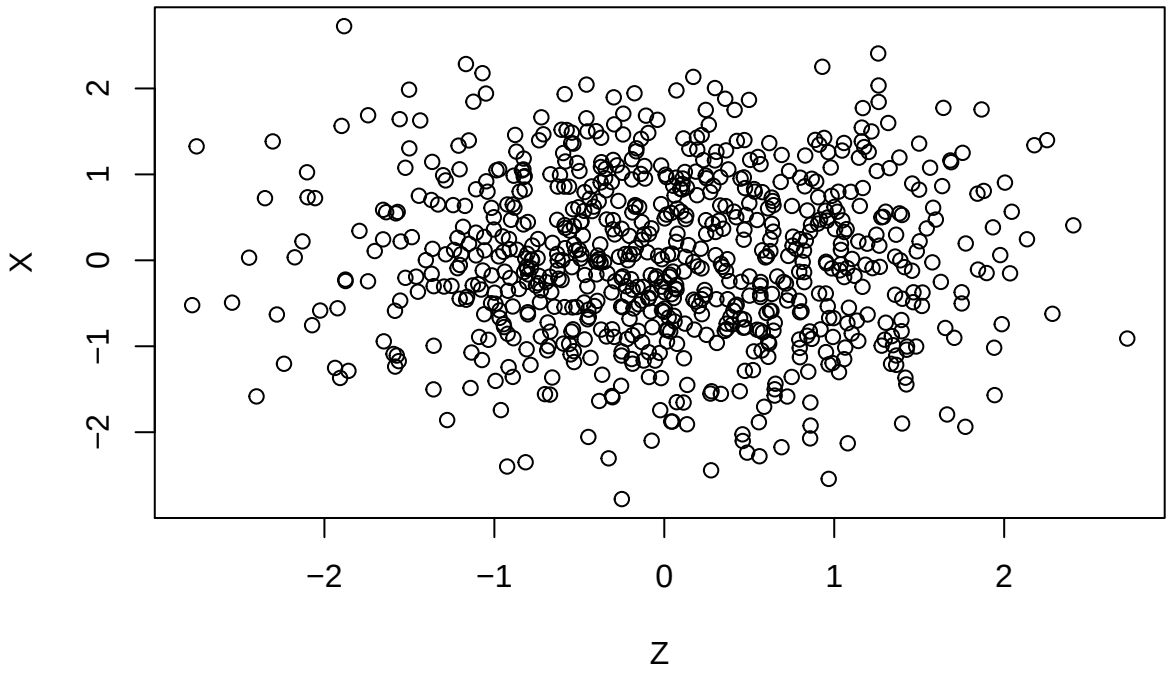
```
for (i in 1:1000){
  if (Y2[i] >= (Y1[i]-1)^2/2){
    if (U[i] < 0.5){
      Z = append(Z,Y1[i]);

    }
    else{
      Z =append(Z,-Y1[i]);
    }
  }
}
```

Plotting histrogram and scatter plots to varify the target density

```
hist(Z)
```




```
L<-length(Z)
X<-c()
for (j in 1:L-1){
  X[j]<-c(Z[j+1])
}
X[L]<-0
plot(Z,X)
```



check-

ing mean and variance for them to be close to {0,1} respectively

```
mean(Z)
```

```
## [1] 0.01594255
```

```
var(Z)
```

```
## [1] 0.9148536
```