*Question 2: simulating year end results*

*Write a function to simulate the assets of the company at year end. From your simulation, find the expected assets at year end and the probability that the company goes bankrupt.*

From the simulation below, the expected end-of-year assets are £1252331. The probability of bankruptcy is 0.0987. These figures were calculated with a value of N=100000.

##Below is the function that will simulate the expected assets at the end of year 1.

assets<-250000

p<-0.1 # probability that a customer makes a claim

n<-1000 # no of customers

z<-6000 # premium

w<-0

a<-3

b<-100000 #parento parameters

#success or failure implies that x is a binomial function

### set the number of simulations

N=100000

#set the loop

for(i in 1:N)

{

x=rbinom(1, n, p)

#x is the number of claims made in a year

U=runif(x)

claim<-(((b^a)/(1-U))^(1/a)-b)

claim

d<-sum(claim)

w[i]<-(assets+n\*z-d)

}

#define q as a vector containing the results of the simulation

q<-c(w[1:N])

expectation<-sum(q)/N

expectation

#count the number of times the insurance company will go bankrupt

count=0

for (i in 1:N)

{

if (q[i]<0) {

count = count + 1

}

}

#number of bankruptcies

print(count)

# probability of bankruptcy

pbankrupt<-count/N

pbankrupt