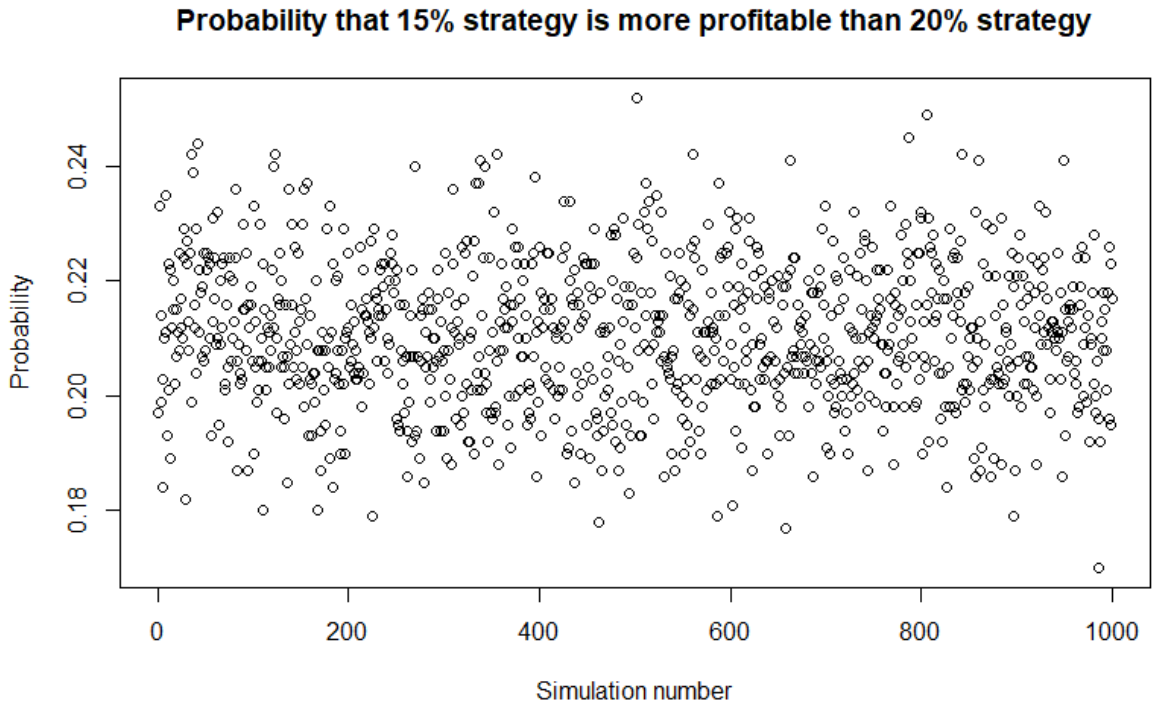
LAB PROJECT 1

5. With the p=0.6 coin (or other), how often 15% strategy is more profitable than 20% strategy after 1000 (or other number) tosses?

Introduction:

The aim of my simulation is finding how often 15% strategy is more profitable than 20% strategy after 1000 tosses. So, I simulated 1000 times (to have more accurate result) the bankroll after 1000 bets with p = 0.6 for Kelly wager = 15% and Kelly wager = 20%. Starting amount = 100$.

Results:



Min. Value	1st Quartile	Median	Mean	3rd Quartile	Max. Value
0.1700	0.2020	0.2100	0.2106	0.2190	0.2520

We can see that mean probability that 15% strategy is more profitable than 20% strategy is 21%. The mean and median value are very close, the difference is only 0.0006.

LAB PROJECT 1

R code:

```
stake15<-0.15
stake20<-0.2
number_of_bets<-1000
number_of_simulations<-1000
final_bankroll15<-rep(0,number_of_bets)
final_bankroll20<-rep(0,number_of_bets)
bankroll<-100
test<-1000
score<-rep(0,test)
x<-rep(0,number_of_simulations)

for(j in 1:test){
  for (i in 1:number_of_simulations){
    s<-rbinom(1,number_of_bets,.6)
    final_bankroll15[i]<-bankroll*(1+stake15)^s*(1-
stake15)^(number_of_bets-s)
    final_bankroll20[i]<-bankroll*(1+stake20)^s*(1-
stake20)^(number_of_bets-s)
    x[i]=(final_bankroll15[i]>final_bankroll20[i])
  }
  score[j]<-(sum(x)/number_of_bets)
}

summary(score)
plot(score, main = "Probability that 15% strategy is more profitable than
20% strategy", xlab = "Simulation number", ylab = "Probability")
```

Created by Robert Zwierzycki