Number\_Of\_Simulations=100

player\_number=1

number\_of\_players=3

########################################################################

cat("Enter number\_of\_players ")

number\_of\_players <- readLines(file("stdin"),1)

cat("Enter player\_number to win ")

player\_number <- readLines(file("stdin"),1)

cat("Enter Number\_Of\_Simulations ")

Number\_Of\_Simulations <- readLines(file("stdin"),1)

Number\_Of\_Simulations <- as.integer(Number\_Of\_Simulations)

player\_number <- as.integer(player\_number)

number\_of\_players <- as.integer(number\_of\_players)

out\_start=paste("number\_of\_players =", number\_of\_players, "player\_number to get winning ticket = ", player\_number, "Number\_Of\_Simulations = ",Number\_Of\_Simulations)

print(out\_start)

theoretiical\_value <-function(player\_number,number\_of\_players)

{

probability\_Of\_n\_player\_win = 1;

# number of tickects = number of playes

p\_cur=1/number\_of\_players;

q\_cur=1-p\_cur;

for(p\_cur\_num\_of\_players in number\_of\_players:player\_number-1)

{

probability\_Of\_n\_player\_win=probability\_Of\_n\_player\_win\*q\_cur

p\_cur=1/p\_cur\_num\_of\_players;

q\_cur=1-p\_cur;

}

probability\_Of\_n\_player\_win=probability\_Of\_n\_player\_win\*p\_cur

return ( probability\_Of\_n\_player\_win)

}

# Using Replicate

# functionsuccess retuns 1 if

# player\_number draw winning ticket

success <-function(player\_number,number\_of\_players)

{

success=0

#create winner number one out of {1,2,3,4,5 k}

winning\_number=sample(1:number\_of\_players, 1)

# draws winner\_number of elemets of the array out of random numbers=number\_of\_payers

# without replacement

# each element of the array reppesent a guess for a winning number

xk <- sample(1:number\_of\_players, player\_number, replace=F)

# match the position of the correct guess

# zero if no correct guess

pos=match( winning\_number,xk,nomatch = 0)

# if the position of correct guess correspond to the

# player\_number then set success and return

if(pos==player\_number)

{

success=1

}

return (success)

}

# Count number of sussesfull guess for player\_number

# and devide on Number\_Of\_Simulations

#This function calculate probability that player\_number

# gets the winning ticket

print('###################################################################')

print('Start using\_replications')

# replicate success function Number\_Of\_Simulations times

using\_replications<-replicate(Number\_Of\_Simulations,

{

success(player\_number,number\_of\_players)

}

)

calculated\_probability2 = length(grep(1, using\_replications))/Number\_Of\_Simulations

print('End using\_replications')

theoretiical\_value\_OfProbability=theoretiical\_value(player\_number,number\_of\_players)

relative\_error2=abs((theoretiical\_value\_OfProbability-calculated\_probability2)\*100/theoretiical\_value\_OfProbability);

out2=paste('player number =' , player\_number , " probability to get winning ticket = " , calculated\_probability2, "theoretical value = ",theoretiical\_value\_OfProbability," relative error = ",relative\_error2, "%")

print(out2)

print("End Of File")

#######################################################################

Number\_Of\_Simulations=100

player\_number=1

number\_of\_players=3

cat("Enter number\_of\_players ")

number\_of\_players <- readLines(file("stdin"),1)

cat("Enter player\_number to win ")

player\_number <- readLines(file("stdin"),1)

cat("Enter Number\_Of\_Simulations ")

Number\_Of\_Simulations <- readLines(file("stdin"),1)

Number\_Of\_Simulations <- as.integer(Number\_Of\_Simulations)

player\_number <- as.integer(player\_number)

number\_of\_players <- as.integer(number\_of\_players)

out\_start=paste("number\_of\_players =", number\_of\_players, "player\_number to get winning ticket = ", player\_number, "Number\_Of\_Simulations = ",Number\_Of\_Simulations)

print(out\_start)

theoretiical\_value <-function(player\_number,number\_of\_players)

{

probability\_Of\_n\_player\_win = 1;

# number of tickects = number of playes

p\_cur=1/number\_of\_players;

q\_cur=1-p\_cur;

for(p\_cur\_num\_of\_players in number\_of\_players:player\_number-1)

{

probability\_Of\_n\_player\_win=probability\_Of\_n\_player\_win\*q\_cur

p\_cur=1/p\_cur\_num\_of\_players;

q\_cur=1-p\_cur;

}

probability\_Of\_n\_player\_win=probability\_Of\_n\_player\_win\*p\_cur

return ( probability\_Of\_n\_player\_win)

}

# FUnction that usues for loop

using\_for\_loop <- function(Number\_Of\_Simulations,player\_number,number\_of\_players) {

number\_of\_successful\_guess=0

for(i in 1:Number\_Of\_Simulations)

{

#create winner number one out of {1,2,3,4,5 k}

winning\_number=sample(1:number\_of\_players, 1)

# draws winner\_number of elemets of the array out of random numbers=number\_of\_payers

# without replacement

# each element of the array reppesent a guess for a winning number

xk <- sample(1:number\_of\_players, player\_number, replace=F)

# match the position of the correct guess

# zero if no correct guess

pos=match(winning\_number,xk,nomatch = 0)

# if the position of correct guess correspond to the

# player\_number then set success and return

if(pos==player\_number)

{

number\_of\_successful\_guess=number\_of\_successful\_guess+1

}

}

return (number\_of\_successful\_guess/Number\_Of\_Simulations)

}

# Calling function that is using for loop

print('###################################################################')

print('Start using\_for\_loop')

calculated\_probability1= using\_for\_loop(Number\_Of\_Simulations,player\_number,number\_of\_players)

print('End using\_for\_loop')

theoretiical\_value\_OfProbability=theoretiical\_value(player\_number,number\_of\_players)

relative\_error1=abs((theoretiical\_value\_OfProbability-calculated\_probability1)\*100/theoretiical\_value\_OfProbability);

out1=paste('player number =' , player\_number , " probability to get winning ticket = " , calculated\_probability1, "theoretical value = ",theoretiical\_value\_OfProbability," relative error = ",relative\_error1 , "%")

print(out1)

print("End Of File")