HW # 1 New Brunswick

For problems 1-5, the current stock price is $70 and the standard deviation is $5

1. What is the probability the stock will be greater then $75?

**16%**

1. What is the probability the stock will be less then $60?

**2.5%**

1. What is the probability the stock will be less then $75 and greater then $60?

**81.5%**

1. What is the probability that the stock will be between $55 and $85?

**99.7%**

1. What is the probability the stock will be greater then $80 or less then $60?

**5%**

1. What is the probability the stock will be greater then $65?

**84%**

1. Create a vector named “cars” with the values: honda, toyota, bmw, infinity, kia

**cars<-c("honda","toyota","bmw","infinity","kia")**

1. There is a vector named “price”, with 5 values corresponding to the cars in #6. Create a dataframe named “carmarket” with those two vectors.

**price<-c(1,2,3,4,5)**

**carmarket<-data.frame(cars, price)**

1. Assume you have the dataframe from #7, and the column name of cars is “cars” and for price is “price”. Make a blue bar graph using ggplot.

**names(carmarket)<-("cars","price")**

**ggplot(carmarket, aes(x=cars, y=price))+**

**geom\_bar(stat = "identity", fill = "blue",color = "black")**

1. You buy a stock at $100. It goes up by 5% then down by 4%, then up by 8%, what is the value of the stock now?

stock<-100\*(1.05)\*(0.96)\*(1.08)

**108.86**

1. You buy a stock at $198. It goes up by 3%, then down by 2%, then up by 2%, what is the value of the stock now?

stock<-198\*(1.03)\*(0.97)\*(1.03)

**203.75**

1. You buy a stock at $50. It goes down by 5%, then up by 4%, then down by 8%, what is the value of the stock now?

stock<-50\*(0.95)\*(1.04)\*(0.92)

**45.448**

1. You have a vector of prices called “prices”, calculate the 1- day returns and put the values in a vector called “ret”

**price<-c(1,2,3,4,5)**

**ret<-(price[2]-price[1])/price[1]**

1. Create a vector called “sumret” that rounds the ret vector to 2 decimal places.

**dr = 100\*dr**

**dr = floor(dr)**

**dr = dr/100**

**sumret<-dr**

**or**

**sumret=round(ret, 2)**

1. Create a frequency table from the “sumret” vector and store the results in “freq”

**table(sumret)**

**freq<-table(sumret)**

1. Create a prob model data frame from “freq”, called “probmodel”

**probmodel = data.frame(freq/sum(freq))**

1. Make a bar graph of probmodel (ret is on x axis, prob are on the y axis), make the graph pink with purple outline.

**ggplot(probmodel, aes(x=ret, y=prob))+**

**geom\_bar(stat = "identity", fill = "pink",color = "purple")**

1. Add another column to probmodel, named signs, make it have the value “pos”, when the return is positive, and “neg”, when the return is 0 or negative.

**for (i in length(ret)){**

**probmodel$signs[i]="pros"**

**}**

**else{**

**probmodel$signs[i]="neg"**

**}**

**}**

1. Make a bar graph of probmodel (ret is on x axis, prob are on the y axis), make the graph blue for pos ones and red for neg ones, with black outline.

**ggplot(carmarket, aes(x=ret, y=prob, fill=signs))+**

**geom\_bar(stat = "identity", postiton\_dodge(), color = "black")**

**+scale\_fill\_maual(values=c(“blue”,”red”))**

Given these vectors for problem 14 & 15

giants=c(2:5)

cowboys=rep(3,4)

eagles=c(6:giants[cowboys[2]])

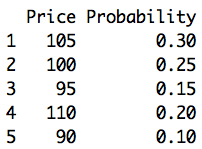
1. What is sum(sum(giants)\*eagles)?

**210**

1. What is sum(giants + c(eagles,cowboys[giants[1]]))?

**32**

1. Investment A can be bought for $100 Given the probability model for Stock A:



What is the ER?

ER=(105-100)/100\*0.3+(100-100) /100\*0.25+(95-100) /100\*0.15+(110-100) /100\*0.2+(90-100) /100\*0.1

**1.75%**

1. What is the R code for ER?

dr=0

dataframe=data.frame(c(105,100,95,110,90),c(0.3,0.25,0.15,0.2,0.1))

names(dataframe)[1]=("Price")

names(dataframe)[2]=("Probability")

for(i in 1:5){

dr[i]=(dataframe$Price[i]-100)/100

}

dataframe$rt=dr

ER=sum(dataframe$Probability\*dataframe$rt)

1. What is the risk (standard deviation) for #29?

**6.179%**

1. What is the sharpe ratio?

**28.318%**

1. What is the R code for the sharpe ratio?

**sd=sqrt(sum(((dataframe$rt-ER)^2)\*dataframe$Probability))**

**mean=ER(dataframe$rt)**

**sharpe=ER/sd**

1. What is the downside deviation?

**4.626%**

1. What is the R code for calculating the downside deviation?

**df=dataframe$rt-mean**

**for(i in 1:5){**

**if(df[i]>0){**

**df[i]=0**

**}**

**}**

**dd =sqrt(sum((df)^2\*dataframe$Probability))**

1. What is the sortino ratio?

**37.824%**

1. What is the R code for the sortino ratio?

**dd =sqrt(sum((df)^2))**

**sortino<-(mean-0)/dd**