#1a

x=as.integer(4)

y=as.integer(5)

z=x+y

print(z)

print(class(z))

#1b

x=as.integer(2)

y=as.integer(4)

z=x/y

print(z)

print(class(z))

#2a

x=seq(1,10,0.1)

print(x)

#2b

y=seq(100,50,-2)

print(y)

#3a

x=c(4,6,3)

rep(x,10)

#3b

paste("Fn",1:30,sep = "")

paste(1:12)

paste(month.abb, letters)

#4a

1+sum(cumprod(seq(2,38,2)/seq(3,39,2)))

#4b

i=c(1:25)

s=sum((2^i)/i + (3^i)/(i^2))

print(s)

#5a

x=c(rep("Control",3),rep("Ear Removal",4),rep("Fake Ear Removal",4))

xfact=factor(x)

print(xfact)

nlevels(xfact)

xtable=data.frame(xfact)

print(xtable)

#5b

x=c(rep("a",25),rep("b",15),rep("c",58))

print(x)

length(x)

xtable=data.frame(x)

print(xtable)

#6a

m=matrix(c(1,1,3,5,2,6,-2,-1,-3),3,3,TRUE)

print(m)

a=m%\*%m%\*%m

print(a)

#6b

m=matrix(c(1,2,-1,3,6,-3,c(3,6,-3)+c(1,2,-1)),3,3)

print(m)

#6c

mt=matrix(c(1,1,3,5,2,6,-2,-1,-3),3,3)

print(mt)

m=t(mt)

print(m)

m=matrix(c(1,1,3,5,2,6,-2,-1,-3),3,3,TRUE)

print(m)

a=m%\*%mt

print(a)

#6d

a=matrix(c(0:4,1:5,2:6,3:7,4:8),5,5)

print(a)

#7a

x=seq(-3,3,length=100)

fun=function(x) {

if(x<=-1)

f=(x\*x)+(2\*x)+3

else if(x>=0 && x<=2)

f=x+3

else

f=(x\*x+(4+x)-7)

}

plot(x,fun(x),"l")

#7b

m=matrix(c(1,1,3,5,2,6,2,1,3),3,3,TRUE)

print(m)

fun=function(m){

for(i in seq(1:3))

{

for(j in seq(1:3))

{

if(m[i,j]%%2!=0)

m[i,j]=m[i,j]\*2;

}

}

return(m)

}

a=fun(m)

a

#8a

usn=paste("1NT14CS",1:10,Sep=" ")

name=c(LETTERS[1:10])

marks=(runif(10,1,20))

df=data.frame(usn,name,marks)

print(df)

#8b

age=ceiling(runif(10,16,21))

df=cbind(df,age)

print(df)

#8C

print(subset(df,age<20 & marks>7))

#9a

xVec=rnorm(5,10,20)

yVec=rnorm(5,10,20)

fun=function(x,y){

temp=outer(y,x,"<")

zVec=colSums(temp)

print(zVec)

}

fun(xVec,yVec)

#9b

fun2=function(x,y){

temp=sapply(x,y,FUN=">")

zVec=colSums(temp)

print(zVec)

}

fun2(xVec,yVec)

#9c

fun3=function(x,y){

temp=vapply(y,FUN=function(y){y<xVec},FUN.VALUE = xVec)

zVec=rowSums(temp)

print(zVec)

}

fun3(xVec,yVec)

#9d

system.time(fun(xVec,yVec))

system.time(fun2(xVec,yVec))

system.time(fun3(xVec,yVec))

#10)a)

zellers = function(d,m,yy){

c <- floor(yy/100)

y <- (yy %% 100)

k <- d

if(m<=2){

y= y-1

m <-m+10}

else

m<-m-2

day<-((floor(2.6\*m-0.2) + k + y + floor(y/4)+floor(c / 4)-2\*c)%%7)

c("Sunday" ,"Monday" ,"Tuesday" ,"Wednusday" , "Thursday" , "Friday" , "Saturday")[day+1]

}

zellers(28,10,1780)

#10 b)

dax = c(24,25,26,27)

max = c(10,10,10,10)

yax = c(2017,2017,2017,2017)

zellers(dax,max,yax)

#11a.

queue1<-function(a,aRate,sRate)

{

w<-0

for(i in 1:a)

{

w<-max(0,w+rexp(1,sRate)-rexp(1,aRate))

}

w

}

queue1(50,2,2)

#11b.

queue2<-function(n,aRate,sRate)

{

w<-0

s<-rexp(n,sRate)

a<-rexp(n,aRate)

for(i in 1:n)

{

w<-max(0,w+s[i]-a[i])

}

w

}

queue2(50,2,2)

queueRep1<-function(nReps,n,aRate,sRate)

{

wVec<-rep(NA,nReps)

for(j in 1:nReps)

#11c.

queueRep3<-function(nReps,n,aRate,sRate)

{

w<-rep(0,nReps)

s<-matrix(rexp(n\*nReps,sRate),ncol=nReps)

a<-matrix(rexp(n\*nReps,aRate),ncol=nReps)

for( i in 1:n)

{

w<-pmax(0,w+s[i,]-a[i,])

}

w

}

queueRep3(3,50,2,2)

system.time(queueRep3(200000,50,2,2))

#12) a

tsEwma <- function(tsDat,m0=0,delta=0.7){

n <-length(tsDat)

mVec <-rep(NA,n+1)

mVec[1] <- m0

for(j in 2:(n+1)){

mVec[j] <-(1-delta)\*tsDat[j-1] + delta \* mVec[j-1]

}

ts(mVec[-1], start=start(tsDat), frequency = frequency((tsDat)))

}

tmp <- ts(1:10,start=c(1960,3),frequency = 12)

tsEwma(tmp)

#12 b)

myListFn <- function(n){

xVec <- rnorm(n)

xBar <- mean(xVec)

print(xBar)

yVec <- sign(xBar)\*rexp(n, rate=abs(1/xBar))

count <- sum(abs(yVec) > abs(xVec))

list(xVec=xVec, yVec=yVec, count=count)

}

lapply(rep(10,4),myListFn)

sapply(rep(10,4),myListFn)

#13

empname=vector(mode="character",length=3)

doj=vector(mode="character",length=3)

empcode=vector(mode="numeric",length=3)

dept=vector(mode="character",length=3)

desig=vector(mode="character",length=3)

for(i in 1:3)

{

empid[i]=as.numeric(readline("enter ID:"))

empname[i]=readline("enter name:")

doj[i]=readline("enter date of joining:")

empcode[i]=as.numeric(readline("enter code:"))

dept[i]=readline("enter department:")

desig[i]=readline("enter desig:")

}

#start entering

data=data.frame(empid,empname,doj,empcode,dept,desig)

print(data)

write.csv(data,file="data.csv")

write.csv2(data,file="data1.csv")

#save above lines 13.R

MyData<-read.csv(file="C:/Users/lab3/Documents/data.csv",header=TRUE,sep=",")

print(MyData)

x<-data.frame('1','cha','15/10/1995','ch123','cs','manager')

write.table(x,file="data.csv",append=TRUE,col.names=FALSE,row.names=TRUE,sep=",")

#run these statements

MyData<-read.csv(file="C:/Users/student/Documents/data.csv",header=TRUE,sep=",")

print(MyData)