#tanveer bariana

#homework 3

#1\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

D <- matrix(c(2, 3, 7, 5, -1, 8, 10, -3, 50), ncol = 3, byrow = TRUE)

b <- matrix(c(5, 1.2, 11))

#a--------------------------------------------------------------------

D1 <- cbind(b, D[, 2:3])

D2 <- cbind(D[,1], b, D[,3])

D3 <- cbind(D[, 1:2], b)

x <- det(D1) / det(D)

y <- det(D2) / det(D)

z <- det(D3) / det(D)

#b-------------------------------------------------------------------

DN1 <- solve(D)

DN1 %\*% b

#it returns more percise values

#c--------------------------------------------------------------------

2 \* x + (3 \* y) + 7 \* z

5 \* x - (y) + 8 \* z

10 \* x - (3 \* y) + 50 \* z

#d---------------------------------------------------------------------

#i

sd(D[, 1])

sd(D[, 2])

sd(D[, 3])

#ii

E <- matrix(c(seq(2,18,by = 2)), ncol = 3)

D \* E

#iii

cbind(D, E)

#2\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

#a-----------------------------------------------------------------------

sampels <- matrix(runif(8000), ncol = 2)

sampels

#b--------------------------------------------------------------------------------------

sam.mean <- apply(sampels, 1, mean)

sam.mean

#c---------------------------------------------------------------------------

hist(sam.mean)

#d---------------------------------------------------------------------------

mean(sam.mean)

sd(sam.mean)

#e--------------------------------------------------------------------------

sam.30 <- matrix(runif(120000), ncol = 30)

sam.30.mean <- apply(sam.30, 1, mean)

hist(sam.30.mean)

mean(sam.30.mean)

sd(sam.30.mean)

#3\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

hmwrk<- c(90, 35, 100, 77, 80)

finla <- c(86, 27, 91, 65, 81)

entire <- matrix(cbind(hmwrk, finla), ncol = 2)

entire

#a------------------------------------------------------------------------------

X <- matrix(rep(1, times= 5))

X <- cbind(X, hmwrk)

y <- finla

y

#b------------------------------------------------------------------------

Xt <- t(X)

Xt %\*% X

dontWorryAboutThis<- Xt %\*% X

#c----------------------------------------------------------------------

itsFine <- (solve(dontWorryAboutThis)) %\*% Xt %\*% y

itsFine[2,]

itsFine[1,]

#d----------------------------------------------------------

abline(a=itsFine[1,], b= itsFine[2,])