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K036

B. Tech CSE Cybersecurity

Semester 4

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LAB 5 PnS

**Code:**

# Arjun Mehta K036

getwd()

myData=read.csv("CardioGoodFitness.csv",

stringsAsFactors = F)

mean=mean(myData$Age)

print(mean)

library(modeest)

mode=mfv(myData$Age)

print(mode)

median=median(myData$Age)

print(median)

max=max(myData$Age)

min=min(myData$Age)

range=max-min

print(range)

variance=var(myData$Age)

print(variance)

std=sd(myData$Age)

print(std)

library(moments)

x=c(0,1,2,3)

p=c(0.1,0.2,0.3,0.4)

m0=1

m1=sum(x\*p)

m2=sum(x\*x\*p)

m3=sum(x\*x\*x\*p)

m4=sum(x\*x\*x\*x\*p)

m=c(m0,m1,m2,m3,m4)

m

raw2central(m)

# Problems

# Arjun Mehta K036

# 1. Problem 1

X1 <- c(0, 1, 2)

P1 <- rep(1/3, 3)

mgf1 <- function(t) {

sum(P1 \* exp(t \* X1))

}

raw\_moments1 <- sapply(1:4, function(n) sum(P1 \* X1^n))

cat("Raw Moments: ", raw\_moments1, "\n")

mean\_X1 <- sum(P1 \* X1)

central\_moments1 <- sapply(1:4, function(n) sum(P1 \* (X1 - mean\_X1)^n))

cat("Central Moments: ", central\_moments1, "\n")

cat("MGF at t=1: ", mgf1(1), "\n")

# 2. Problem 2

M1 <- 2

M2 <- 10

M3 <- -30

mean\_X2 <- M1 + 3

variance\_X2 <- M2 + (M1 + 3)^2 - 9

skewness\_X2 <- M3 / (variance\_X2^(3/2))

cat("Mean: ", mean\_X2, "\n")

cat("Variance: ", variance\_X2, "\n")

cat("Skewness: ", skewness\_X2, "\n")

# 3. Problem 3

X3 <- 0:3

P3 <- (1/8) \* X3

mgf3 <- function(t) {

sum(P3 \* exp(t \* X3))

}

mean\_X3 <- sum(P3 \* X3)

variance\_X3 <- sum(P3 \* (X3 - mean\_X3)^2)

cat("MGF at t=1: ", mgf3(1), "\n")

cat("Mean: ", mean\_X3, "\n")

cat("Variance: ", variance\_X3, "\n")

# 4. Problem 4

X4 <- c(-2, 3, 1)

P4 <- c(1/3, 1/2, 1/6)

mean\_X4 <- sum(P4 \* X4)

moments\_about\_mean4 <- sapply(1:4, function(n) sum(P4 \* (X4 - mean\_X4)^n))

cat("First Four Moments about Mean: ", moments\_about\_mean4, "\n")

**Output:**



