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# Appendix A

## Question 1

### Part i

df <- c(300,440,350,1100,640,480,450,700,670,530)  
avg\_exp <- mean(df)  
avg\_exp

[1] 566

Average monthly expenditures is 566.

### Part ii

med\_exp <- median(df)  
med\_exp

[1] 505

Median monthly expenditures is 505.

### Part iii

mean((df/100))

[1] 5.66

median((df/100))

[1] 5.05

They would each be divided by 100—becoming 5.66 and 6.05, respectively.

### Part iv

df[8] = 900  
avg\_exp2 <- mean(df)  
avg\_exp2

[1] 586

med\_exp2 <- median(df)  
med\_exp2

[1] 505

The mean is increased by 20 while the median does not change.

## Question 2

.18-.15

[1] 0.03

(.18-.15)/.15

[1] 0.2

The majority shareholder considered the absolute change in percent return—.18-.15=.03 The CEO considered the relative change in percent return—.18-.15/.15=.2

## Question 3

### Part (i)

salary <- function(exper) {exp(10.6+(0.027\*exper))}   
salary(c(0,5))

[1] 40134.84 45935.80

The salary when is 40,134.84 while the salary when is 45,935.80.

### Part (ii)

dy <- function(dx){(100\*0.027)\*dx}  
dy(5)

[1] 13.5

### Part (iii)

((salary(5)-salary(0))/salary(0))\*100

[1] 14.45368

The estimator gives a change on 13.5 percent while the model has a change of 14.45 percent.

## Question 4

### Part (i)

pnorm(6,5,sqrt(4), lower.tail = TRUE)

[1] 0.6914625

### Part (ii)

pnorm(4,5,sqrt(4), lower.tail = FALSE)

[1] 0.6914625

### Part (iii)

pnorm(4,mean= 5,sd = sqrt(4)) + (pnorm(6,mean = 5,sd = sqrt(4), lower.tail = FALSE))

[1] 0.6170751

## Question 5

F <- function(x) {  
 (3\*(x^2))-(2\*(x^3))  
}  
1-F(.6)

[1] 0.352

The probability that the elderly employment rate is at least 60 percent is 0.352

## Question 6

52.3\*1000

[1] 52300

14.6\*1000

[1] 14600

The mean and standard deviation are both just multiplied by 1,000.