Problem Set 8

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STAT 100, SECTION 0221

PROBLEM #1

```
> #1(a) - extract BMI variable from the dataset, by Kristina Finley
> BMI <- BodyFatPercentage$BMI
> #calculate the sample mean, sample standard deviation, and sample size for BMI, by Kristina Finley
> BMI_mean <- mean(BMI)
> BMI_SD <- sd(BMI)
> BMI_size <- length(BMI)
> BMI_mean
[1] 20.70578
> BMI_SD
[1] 4.325135
> BMI_size
[1] 92
>
```

B.

99% confidence interval

$$20.71 + 2.576 \times \left(\frac{4.325}{\sqrt{92}}\right)$$

$$20.71 - 2.576 \times \left(\frac{4.325}{\sqrt{92}}\right)$$

= (19.544, 21.868)

C.

Point Estimation

$\frac{21.868 + 19.544}{2}$ **= 20.706**

D.

Margin of Error

$\frac{21.868 - 19.544}{2}$ **= 1.162**

E.

We are 99% confident that the population mean body mass index of adolescent girls lies between 19.544 and 21.868.

F.

95% confidence interval

$20.71 + 2.0 \times (\frac{4.325}{\sqrt{92}})$

$20.71 - 2.0 \times (\frac{4.325}{\sqrt{92}})$

= (19.804, 21.608)

G.

Point Estimation

$\frac{21.608 + 19.804}{2}$ **= 20.706**

H.

Margin of Error

$\frac{21.608 - 19.804}{2}$ **= 0.902**

PROBLEM #2

```
> #2(a) - extract two tables for the Activity variable , by Kristina Finley
> Activity <- BodyFatPercentage$Activity
> #create freq table & prop table for Activity, by Kristina Finley
> Activity_Freq_Table <- table(Activity)
> Activity_Prop_Table <- prop.table(Activity_Freq_Table)
> Activity_Freq_Table
Activity
  high    low medium
    10      6     76
> Activity_Prop_Table
Activity
      high        low     medium
0.10869565 0.06521739 0.82608696
>
```

B.

90% confidence interval

$0.109 + 1.645 (\sqrt{\frac{0.109(0.891)}{92}})$

$0.109 - 1.645 (\sqrt{\frac{0.109(0.891)}{92}})$

= (0.056, 0.162)

C.

Point Estimate

$\frac{0.162 + 0.056}{2}$ = **0.109**

D.

Margin of Error

$\frac{0.162 - 0.056}{2}$ = **0.053**

E.

We are 90% confident that the population proportion of adolescent girls with high activity levels lies between 0.056 and 0.162.

PROBLEM #3

A.

99% confidence interval

Point Estimate = Sample Mean

$\frac{5.63 + 5.05}{2}$ = **5.34**

B.

$\frac{Upper\ Bound - 5.17}{2}$ = 0.17 → 2 × 0.17 + 5.17

Upper Bound → **5.51**

C.

95% confidence interval

$\frac{1}{(0.0175)^2}$ = 3265.31 → **3266**