R Commands - Confidence Intervals

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2022 MCAS ELA (English Language Arts)

Disability Status:

- Students With Disabilities (95% Confidence Interval)

```
Mean_Score <- mean(Disabilities_2022_MCAS_ELA_Scores_List)
Standard_Deviation_Score <- sd(Disabilities_2022_MCAS_ELA_Scores_List)
alpha <- 0.05
n <- nrow(Disabilities_2022_MCAS_ELA_Scores)
df <- n - 1
Confidence_Interval <- Mean_Score + (c(-1, 1) * qt(1 - (alpha / 2), df) * (Standard_Deviation_Score / sqrt(n)))
Confidence_Interval
```

- Students With No Disabilities (95% Confidence Interval)

```
Mean_Score <- mean(No_Disabilities_2022_MCAS_ELA_Scores_List)
Standard_Deviation_Score <- sd(No_Disabilities_2022_MCAS_ELA_Scores_List)
alpha <- 0.05
n <- nrow(No_Disabilities_2022_MCAS_ELA_Scores)
df <- n - 1
Confidence_Interval <- Mean_Score + (c(-1, 1) * qt(1 - (alpha / 2), df) * (Standard_Deviation_Score / sqrt(n)))
Confidence_Interval
```

Disability Status	95% Confidence Interval
Students With Disabilities	$(476.4317, 477.9626)$
Students With No Disabilities	$(499.3013, 500.9473)$

Family Income:

- Low Income Households (95% Confidence Interval)

```
Mean_Score <- mean(Low_Income_2022_MCAS_ELA_Scores_List)
Standard_Deviation_Score <- sd(Low_Income_2022_MCAS_ELA_Scores_List)
alpha <- 0.05
n <- nrow(Low_Income_2022_MCAS_ELA_Scores)
df <- n - 1
Confidence_Interval <- Mean_Score + (c(-1, 1) * qt(1 - (alpha / 2), df) * (Standard_Deviation_Score / sqrt(n)))
Confidence_Interval
```

- Non-Low Income Households (95% Confidence Interval)

```
Mean_Score <- mean(Non_Low_Income_2022_MCAS_ELA_Scores_List)
Standard_Deviation_Score <- sd(Non_Low_Income_2022_MCAS_ELA_Scores_List)
alpha <- 0.05
df <- n - 1
Confidence_Interval <- Mean_Score + (c(-1, 1) * qt(1 - (alpha / 2), df) * (Standard_Deviation_Score / sqrt(n)))
Confidence_Interval
```

Family Income	95% Confidence Interval
Low Income Households	$(488.2402, 489.4595)$
Non-Low Income Households	$(499.2378, 500.6097)$

Gender:

- Male Students (95% Confidence Interval)

```
Mean_Score <- mean(Male_2022_MCAS_ELA_Scores_List)
Standard_Deviation_Score <- sd(Male_2022_MCAS_ELA_Scores_List)
alpha <- 0.05
n <- nrow(Male_2022_MCAS_ELA_Scores)
df <- n - 1
Confidence_Interval <- Mean_Score + (c(-1, 1) * qt(1 - (alpha / 2), df) * (Standard_Deviation_Score / sqrt(n)))
Confidence_Interval
```

- Female Students (95% Confidence Interval)

```
Mean_Score <- mean(Female_2022_MCAS_ELA_Scores_List)
Standard_Deviation_Score <- sd(Female_2022_MCAS_ELA_Scores_List)
alpha <- 0.05
n <- nrow(Female_2022_MCAS_ELA_Scores)
df <- n - 1
Confidence_Interval <- Mean_Score + (c(-1, 1) * qt(1 - (alpha / 2), df) * (Standard_Deviation_Score / sqrt(n)))
Confidence_Interval
```

Gender	**95% Confidence Interval**
Male Students	$(491.6433, 493.2745)$
Female Students	$(497.9330, 499.6206)$

Race/Ethnicity:

- African American/Black (95% Confidence Interval)

```
Mean_Score <- mean(AA_B_2022_MCAS_ELA_Scores_List)
Standard_Deviation_Score <- sd(AA_B_2022_MCAS_ELA_Scores_List)
alpha <- 0.05
n <- nrow(AA_B_2022_MCAS_ELA_Scores)
df <- n - 1
Confidence_Interval <- Mean_Score + (c(-1, 1) * qt(1 - (alpha / 2), df) * (Standard_Deviation_Score / sqrt(n)))
Confidence_Interval
```

- American Indian/Alaska Native (95% Confidence Interval)

```
Mean_Score <- mean(AI_AN_2022_MCAS_ELA_Scores_List)
Standard_Deviation_Score <- sd(AI_AN_2022_MCAS_ELA_Scores_List)
alpha <- 0.05
n <- nrow(AI_AN_2022_MCAS_ELA_Scores)
df <- n - 1
Confidence_Interval <- Mean_Score + (c(-1, 1) * qt(1 - (alpha / 2), df) * (Standard_Deviation_Score / sqrt(n)))
Confidence_Interval
```

- Asian (95% Confidence Interval)

```
Mean_Score <- mean(Asian_2022_MCAS_ELA_Scores_List)
Standard_Deviation_Score <- sd(Asian_2022_MCAS_ELA_Scores_List)
alpha <- 0.05
n <- nrow(Asian_2022_MCAS_ELA_Scores)
df <- n - 1
Confidence_Interval <- Mean_Score + (c(-1, 1) * qt(1 - (alpha / 2), df) * (Standard_Deviation_Score / sqrt(n)))
Confidence_Interval
```

- Hispanic/Latino (95% Confidence Interval)

```
Mean_Score <- mean(Hispanic_Latino_2022_MCAS_ELA_Scores_List)
Standard_Deviation_Score <- sd(Hispanic_Latino_2022_MCAS_ELA_Scores_List)
alpha <- 0.05
n <- nrow(Hispanic_Latino_2022_MCAS_ELA_Scores)
df <- n - 1
Confidence_Interval <- Mean_Score + (c(-1, 1) * qt(1 - (alpha / 2), df) * (Standard_Deviation_Score / sqrt(n)))
Confidence_Interval
```

- Native Hawaiian/Pacific Islander (95% Confidence Interval)

```
Mean_Score <- mean(NH_PI_2022_MCAS_ELA_Scores_List)
Standard_Deviation_Score <- sd(NH_PI_2022_MCAS_ELA_Scores_List)
alpha <- 0.05
n <- nrow(NH_PI_2022_MCAS_ELA_Scores)
df <- n - 1
Confidence_Interval <- Mean_Score + (c(-1, 1) * qt(1 - (alpha / 2), df) * (Standard_Deviation_Score / sqrt(n)))
Confidence_Interval
```

- White (95% Confidence Interval)

```
Mean_Score <- mean(White_2022_MCAS_ELA_Scores_List)
Standard_Deviation_Score <- sd(White_2022_MCAS_ELA_Scores_List)
alpha <- 0.05
n <- nrow(White_2022_MCAS_ELA_Scores)
df <- n - 1
Confidence_Interval <- Mean_Score + (c(-1, 1) * qt(1 - (alpha / 2), df) * (Standard_Deviation_Score / sqrt(n)))
Confidence_Interval
```

- Other (95% Confidence Interval)

```
Mean_Score <- mean(Other_2022_MCAS_ELA_Scores_List)
Standard_Deviation_Score <- sd(Other_2022_MCAS_ELA_Scores_List)
alpha <- 0.05
n <- nrow(Other_2022_MCAS_ELA_Scores)
df <- n - 1
Confidence_Interval <- Mean_Score + (c(-1, 1) * qt(1 - (alpha / 2), df) * (Standard_Deviation_Score / sqrt(n)))
Confidence_Interval
```

Race/Ethnicity	**95% Confidence Interval**
African American/Black	$(488.0109, 489.7153)$
American Indian/Alaska Native	$(482.9451, 491.2902)$
Asian	$(502.9615, 505.4385)$
Hispanic/Latino	$(488.4112, 490.1566)$
Native Hawaiian/Pacific Islander	$(479.0115, 522.1885)$
White	$(496.9516, 498.4219)$
Other	$(496.5315, 498.7744)$

2022 MCAS MATH (Mathematics)

Disability Status:

- Students With Disabilities (95% Confidence Interval)

```
Mean_Score <- mean(Disabilities_2022_MCAS_MATH_Scores_List)
Standard_Deviation_Score <- sd(Disabilities_2022_MCAS_MATH_Scores_List)
alpha <- 0.05
n <- nrow(Disabilities_2022_MCAS_MATH_Scores)
df <- n - 1
Confidence_Interval <- Mean_Score + (c(-1, 1) * qt(1 - (alpha / 2), df) * (Standard_Deviation_Score / sqrt(n)))
Confidence_Interval
```

- Students With No Disabilities (95% Confidence Interval)

```
Mean_Score <- mean(No_Disabilities_2022_MCAS_MATH_Scores_List)
Standard_Deviation_Score <- sd(No_Disabilities_2022_MCAS_MATH_Scores_List)
alpha <- 0.05
n <- nrow(No_Disabilities_2022_MCAS_MATH_Scores)
df <- n - 1
Confidence_Interval <- Mean_Score + (c(-1, 1) * qt(1 - (alpha / 2), df) * (Standard_Deviation_Score / sqrt(n)))
Confidence_Interval
```

Disability Status	95% Confidence Interval
Students With Disabilities	$(476.3635, 478.0080)$
Students With No Disabilities	$(497.5737, 499.5619)$

Family Income:

- Low Income Households (95% Confidence Interval)

```
Mean_Score <- mean(Low_Income_2022_MCAS_MATH_Scores_List)
Standard_Deviation_Score <- sd(Low_Income_2022_MCAS_MATH_Scores_List)
alpha <- 0.05
n <- nrow(Low_Income_2022_MCAS_MATH_Scores)
df <- n - 1
Confidence_Interval <- Mean_Score + (c(-1, 1) * qt(1 - (alpha / 2), df) * (Standard_Deviation_Score / sqrt(n)))
Confidence_Interval
```

- Non-Low Income Households (95% Confidence Interval)

```
Mean_Score <- mean(Non_Low_Income_2022_MCAS_MATH_Scores_List)
Standard_Deviation_Score <- sd(Non_Low_Income_2022_MCAS_MATH_Scores_List)
alpha <- 0.05
df <- n - 1
Confidence_Interval <- Mean_Score + (c(-1, 1) * qt(1 - (alpha / 2), df) * (Standard_Deviation_Score / sqrt(n)))
Confidence_Interval
```

Family Income	95% Confidence Interval
Low Income Households	$(486.1122, 487.4912)$
Non-Low Income Households	$(498.2196, 499.8934)$

Gender:

- Male Students (95% Confidence Interval)

```
Mean_Score <- mean(Male_2022_MCAS_MATH_Scores_List)
Standard_Deviation_Score <- sd(Male_2022_MCAS_MATH_Scores_List)
alpha <- 0.05
n <- nrow(Male_2022_MCAS_MATH_Scores)
df <- n - 1
Confidence_Interval <- Mean_Score + (c(-1, 1) * qt(1 - (alpha / 2), df) * (Standard_Deviation_Score / sqrt(n)))
Confidence_Interval
```

- Female Students (95% Confidence Interval)

```
Mean_Score <- mean(Female_2022_MCAS_MATH_Scores_List)
Standard_Deviation_Score <- sd(Female_2022_MCAS_MATH_Scores_List)
alpha <- 0.05
n <- nrow(Female_2022_MCAS_MATH_Scores)
df <- n - 1
Confidence_Interval <- Mean_Score + (c(-1, 1) * qt(1 - (alpha / 2), df) * (Standard_Deviation_Score / sqrt(n)))
Confidence_Interval
```

Gender	95% Confidence Interval
Male Students	$(494.0018, 496.0152)$
Female Students	$(492.7546, 494.6692)$

Race/Ethnicity:

- African American/Black (95% Confidence Interval)

```
Mean_Score <- mean(AA_B_2022_MCAS_MATH_Scores_List)
Standard_Deviation_Score <- sd(AA_B_2022_MCAS_MATH_Scores_List)
alpha <- 0.05
n <- nrow(AA_B_2022_MCAS_MATH_Scores)
df <- n - 1
Confidence_Interval <- Mean_Score + (c(-1, 1) * qt(1 - (alpha / 2), df) * (Standard_Deviation_Score / sqrt(n)))
Confidence_Interval
```

- American Indian/Alaska Native (95% Confidence Interval)

```
Mean_Score <- mean(AI_AN_2022_MCAS_MATH_Scores_List)
Standard_Deviation_Score <- sd(AI_AN_2022_MCAS_MATH_Scores_List)
alpha <- 0.05
n <- nrow(AI_AN_2022_MCAS_MATH_Scores)
df <- n - 1
Confidence_Interval <- Mean_Score + (c(-1, 1) * qt(1 - (alpha / 2), df) * (Standard_Deviation_Score / sqrt(n)))
Confidence_Interval
```

- Asian (95% Confidence Interval)

```
Mean_Score <- mean(Asian_2022_MCAS_MATH_Scores_List)
Standard_Deviation_Score <- sd(Asian_2022_MCAS_MATH_Scores_List)
alpha <- 0.05
n <- nrow(Asian_2022_MCAS_MATH_Scores)
df <- n - 1
Confidence_Interval <- Mean_Score + (c(-1, 1) * qt(1 - (alpha / 2), df) * (Standard_Deviation_Score / sqrt(n)))
Confidence_Interval
```

- Hispanic/Latino (95% Confidence Interval)

```
Mean_Score <- mean(Hispanic_Latino_2022_MCAS_MATH_Scores_List)
Standard_Deviation_Score <- sd(Hispanic_Latino_2022_MCAS_MATH_Scores_List)
alpha <- 0.05
n <- nrow(Hispanic_Latino_2022_MCAS_MATH_Scores)
df <- n - 1
Confidence_Interval <- Mean_Score + (c(-1, 1) * qt(1 - (alpha / 2), df) * (Standard_Deviation_Score / sqrt(n)))
Confidence_Interval
```

- Native Hawaiian/Pacific Islander (95% Confidence Interval)

```
Mean_Score <- mean(NH_PI_2022_MCAS_MATH_Scores_List)
Standard_Deviation_Score <- sd(NH_PI_2022_MCAS_MATH_Scores_List)
alpha <- 0.05
n <- nrow(NH_PI_2022_MCAS_MATH_Scores)
df <- n - 1
Confidence_Interval <- Mean_Score + (c(-1, 1) * qt(1 - (alpha / 2), df) * (Standard_Deviation_Score / sqrt(n)))
Confidence_Interval
```

- White (95% Confidence Interval)

```
Mean_Score <- mean(White_2022_MCAS_MATH_Scores_List)
Standard_Deviation_Score <- sd(White_2022_MCAS_MATH_Scores_List)
alpha <- 0.05
n <- nrow(White_2022_MCAS_MATH_Scores)
df <- n - 1
Confidence_Interval <- Mean_Score + (c(-1, 1) * qt(1 - (alpha / 2), df) * (Standard_Deviation_Score / sqrt(n)))
Confidence_Interval
```

- Other (95% Confidence Interval)

```
Mean_Score <- mean(Other_2022_MCAS_MATH_Scores_List)
Standard_Deviation_Score <- sd(Other_2022_MCAS_MATH_Scores_List)
alpha <- 0.05
n <- nrow(Other_2022_MCAS_MATH_Scores)
df <- n - 1
Confidence_Interval <- Mean_Score + (c(-1, 1) * qt(1 - (alpha / 2), df) * (Standard_Deviation_Score / sqrt(n)))
Confidence_Interval
```

Race/Ethnicity	**95% Confidence Interval**
African American/Black	$(484.4341, 486.3593)$
American Indian/Alaska Native	$(482.0051, 491.7596)$
Asian	$(506.5562, 509.5984)$
Hispanic/Latino	$(486.3068, 488.1642)$
Native Hawaiian/Pacific Islander	$(469.5571, 522.0429)$
White	$(495.7054, 497.3943)$
Other	$(494.9748, 497.6371)$