

Homework 3 Part 2

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Problem 1

Question 1

Null Hypothesis: Mean Engagement of the Students who become knowledgeable in the course is 0.75

Alternate Hypothesis: Mean Engagement of the Students who become knowledgeable in the course is not 0.75

The type of test that can be used is the **z-test** as we have more than 30 datapoints in our sample based on the rule of thumb

Question 2

- Standard Deviation of Sample is 0.12712605795317614
- The Sample size is 937
- The Sample mean is 0.743
- Standard Error of Sample is 0.00415
- The Sample mean is 0.743
- z-score of Sample is -1.68
- p-value of Sample is 0.0933
- The result is significant at an alpha value of 0.1. Therefore we can reject the Null Hypothesis and the average is not 0.75

Question 3

- z-score of sample where 0.05 is significant is -1.96
- Standard Deviation of sample is 0.127
- Standard Error of sample is 0.00356
- Minimum number of data points in the sample needed to be significant at 0.05 is 1279

Question 4

The **Null Hypothesis** is the mean in engagement between the students who become knowledgeable and the students who do not will be different

The **Alternate Hypothesis** is the mean in engagement between the students who become knowledgeable and the students who do not will not be different

The type of test that can be used is the **z-test** as we have more than 30 datapoints in our sample based on the rule of thumb

Question 5

- The sample size of eng0 is 1977 and the sample size of eng1 is 937
- The mean is -0.103
- The standard deviation is 0.00707
- The z-score is -121
- p-value is 0.0
- The Null hypothesis can be rejected

Problem 2

Question 1

- For this sample of data a t-test is required as it has less than 30 datapoints
- Sample Mean is 7.36
- Standard Deviation is 16.8
- Standard Error is 5.08
- 95% Confidence interval: (-3.95 , 18.7)

Question 2

- 90% Confidence interval: (-1.84, 16.6)
- The t-score and interval decreased because the confidence decreased by 5%

Question 3

- A standard distribution is used because the population standard deviation is given
- Standard Error is 5.08
- Confidence interval: (-2.59, 17.3)

Question 4

- Confidence Level is 0.822
- Confidence Interval is (0, 14.73)
- The confidence level is 0.82 so we are 82 percent confident that the team will win over average