Graphical user interface, text

Description automatically generated with medium confidence

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| Abhilash Kumar Dikshit  R Practice: ALY 6010 | Module 1  Week 1 |

Data

This data came from a survey of students and the purpose of the survey was to identify attitudes and habits regarding food consumption at school and outside of school.

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| A picture containing text  Description automatically generated | Total number of observations is 137 and total number of variables is 13 with no blank cells. | |
| Text  Description automatically generatedDescription of Variables  1. Gender: What gender do you identify as? 2. Boarding: Day or Boarding? 3. Grade: What grade are you in? 4. Athlete: Do you consider yourself an athlete? 5. Activities: Are you participating in any of the following activities this season? 6. DHBreakfast: How many days a week do you eat breakfast in the dining hall (including brunch on Saturday and Sunday)? | | 1. NDHBreakfast: How many days a week do you eat breakfast but not in the dining hall? 2. BClass: Would you be more likely to eat breakfast if you could eat it in class? 3. DHBoxes: On average, how many boxes of food do you eat per meal at the dining hall? 4. NDHBoxes: How many boxes do you take from the dining hall to eat later? 5. NDHMeals: How many meals a week do you eat in the dorm or student center? 6. Nutrition: On a scale of 0 to 5, how aware are you of the nutritional values of the food you eat? 7. Money: On average, how much money do spend on food outside of the dining hall per week? |

Test Statistic

The test statistic for a One-Sample Test is denoted as “t”, which is calculated using the following formula:

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| Text  Description automatically generated with medium confidence | The T-test is commonly used with small sample sizes.  **Syntax**: *t.test (x, mu = 0)*  **Arguments**:  - x: A vector to compute the one-sample t-test  - mu: Mean of the population, by default, set to `0`  **Normality Test Result Interpretation:**  p-value = 0.00000002392  p-value < 0.05, reject the null hypothesis  Ho: The underlying population mean is equal to 2.5 grams  Ha: The underlying population mean is not equal to 2.5 grams  It was found that the average nutrition value was greater than 2.5 grams, but we need to prove whether this assumption is true. |

Test 1- One sample test for mean Nutrition

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|  | Two-tailed Alternative Hypothesis Test Result Interpretation: p-value = 0.1941  p-value > 0.05, fail to reject the null hypothesis  Ho: the sample data are not significantly different than a normal population (normal distribution)  Ha: the sample data are significantly different than a normal population  Upper-tailed Alternative Hypothesis Test Result Interpretation: p-value = 0.09704  p-value > 0.05, fail to reject the null hypothesis  Ho: the sample data are not significantly different than a normal population (normal distribution)  Ha: the sample data are significantly different than a normal population  Lower-tailed Alternative Hypothesis Test Result Interpretation: p-value = 0.903  p-value > 0.05, fail to reject the null hypothesis  Ho: the sample data are not significantly different than a normal population (normal distribution)  Ha: the sample data are significantly different than a normal population |

Box Plot for Nutrition Distribution (Jittered points to show individual observation)

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|  | The results here show the following components:  Red dot denotes the theoretical mean value of Nutrition i.e., 2.679.  The jittered points show the individual observations for Nutrition. |

Test 1- One sample test for mean NDHMeals

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|  | Two-tailed Alternative Hypothesis Test Result Interpretation: p-value = 0.1941  p-value > 0.05, fail to reject the null hypothesis  Ho: the sample data are not significantly different than a normal population (normal distribution)  Ha: the sample data are significantly different than a normal population  Upper-tailed Alternative Hypothesis Test Result Interpretation: p-value = 0.09704  p-value > 0.05, fail to reject the null hypothesis  Ho: the sample data are not significantly different than a normal population (normal distribution)  Ha: the sample data are significantly different than a normal population  Lower-tailed Alternative Hypothesis Test Result Interpretation: p-value = 0.903  p-value > 0.05, fail to reject the null hypothesis  Ho: the sample data are not significantly different than a normal population (normal distribution)  Ha: the sample data are significantly different than a normal population |

Box Plot for NDHMeals with common legend Grade

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|  | The results here show the following components:  Red dot denotes the theoretical mean value of NDHMeals i.e., 3.19.  The jittered points show the individual observations for NDHMeals. |

Nutrition: Theoretical calculation of p class from a t Distribution

***P VALUE***

The p-value ranges from 0 to 1, and is interpreted as follow:

A p-value lower than 0.05 means you are strongly confident to reject the null hypothesis

A p-value higher than 0.05 indicates that you don’t have enough evidence to reject the null hypothesis.

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| Graphical user interface, text, application  Description automatically generated  **Two-sided hypothesis test**  The p-value is 0.1940841. If we use a significance level of α = 0.05, as the p-value is not less than 0.05, we don’t have enough evidence to reject the null hypothesis. | **Left-tailed test**  The p-value is 0.902958. If we use a significance level of α = 0.05, as the p-value is not less than 0.05, we don’t have enough evidence to reject the null hypothesis.  **Right-tailed test**  The p-value is 0.09704203. If we use a significance level of α = 0.05, as the p-value is not less than 0.05, we don’t have enough evidence to reject the null hypothesis. |

NDHMeals: Theoretical calculation of p class from a t Distribution

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| **Two-sided hypothesis test**  The p-value is 0.001685734. If we use a significance level of α = 0.05, as the p-value is less than 0.05, we have enough evidence to reject the null hypothesis. | **Left-tailed test**  The p-value is 0.000842867 If we use a significance level of α = 0.05, as the p-value is less than 0.05, we have enough evidence to reject the null hypothesis.  **Right-tailed test**  The p-value is 0.9991571. If we use a significance level of α = 0.05, as the p-value is less than 0.05, we have enough evidence to reject the null hypothesis. |

## Two-sample T-test

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|  | *Null Hypothesis (Ho): The data is corelated*  *Alternative Hypothesis (Ha): The data is not corelated*  In Two sample T-test, we have compared two samples *DHBreakfast* and *Boarding* from *Food* data frame.  Here, the P-value for the variables DHBreakfast and *Boarding* is 0.4308 which is more than 0.005, so we cannot reject the null hypothesis.  Hence our Null Hypothesis is True.  Conclusion - The variables DHBreakfast and *Boarding* are corelated. |

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|  | From the shown boxplot, we can depict that the students in Boarding on an average 4 days per week eat breakfast in the dining hall (including brunch on Saturday and Sunday) as compared to the Day. |

## References

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5. *RPubs - How do I get P-values and critical values from R? (2017, March 1).*[*https://rpubs.com/mdlama/spring2017-lab6supp1*](https://rpubs.com/mdlama/spring2017-lab6supp1)