1. Alcohol is blamed for a lot of problems with college students. In particular, it is widely believed that students that

drink heavily also do poor in class. A recent study at SLU collected information on sleep habits to investigate their connection to stress levels in students. This data (SleepStudy\_Full.csv) also contains information on the students’ GPA and self-reported drinking habits (abstaining, light, moderate, or heavy). Is there a connection between drinking habits and GPA?

* 1. Write of the null and alternative hypotheses that would be consistent with our research question.

* 1. Reconstruct the output below and complete the ANOVA F-test.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| In Minitab: *Stat > ANOVA > One-way Enter Response (numerical) and Factor (categorical). Click “Graphs” and select Boxplot of Data. (Eventually we’ll add another step to this)* **One-way ANOVA: GPA versus AlcoholUse**  **Method**   |  |  | | --- | --- | | Null hypothesis | All means are equal | | Alternative hypothesis | Not all means are equal | | Significance level | α = 0.05 |   *Equal variances were assumed for the analysis.*  **Factor Information**   |  |  |  | | --- | --- | --- | | **Factor** | **Levels** | **Values** | | AlcoholUse | 4 | 1.Abstain, 2.Light, 3.Moderate, 4.Heavy |   **Analysis of Variance**   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **Source** | **DF** | **Adj SS** | **Adj MS** | **F-Value** | **P-Value** | | AlcoholUse | 3 | 0.6013 | 0.2004 | 1.23 | 0.299 | | Error | 249 | 40.5871 | 0.1630 |  |  | | Total | 252 | 41.1884 |  |  |  |   **Model Summary**   |  |  |  |  | | --- | --- | --- | --- | | **S** | **R-sq** | **R-sq(adj)** | **R-sq(pred)** | | 0.403733 | 1.46% | 0.27% | 0.00% |   **Means**   |  |  |  |  |  | | --- | --- | --- | --- | --- | | **AlcoholUse** | **N** | **Mean** | **StDev** | **95% CI** | | 1.Abstain | 34 | 3.3215 | 0.4793 | (3.1851, 3.4578) | | 2.Light | 83 | 3.2805 | 0.3849 | (3.1932, 3.3678) | | 3.Moderate | 120 | 3.2088 | 0.3889 | (3.1362, 3.2813) | | 4.Heavy | 16 | 3.151 | 0.437 | (2.952, 3.350) |   *Pooled StDev = 0.40373* |  |