Green Route or Red Route? A Statistics Project

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The AppalCART operates several routes that serve ASU and the Boone area. As a relatively newcomer in this town, I am interested in knowing a lot of things about its operation. Your task in this project is to help me figure out some of the things that would help me learn about AppalCART. You will need to write a written report with at least 3 pages. Your report should address at least the following issues/topics:

1. Some general background information about the AppalCART (a little bit of history and possibly a description of its basic operation)

2. Which route (red route, green route, etc) is the busiest route? (give your definition of what busy could mean) Which is the next busiest route? And so on until the least busy. Cite statistics and present graphs that would support your answer. Think of a situation where this information might be useful.

3. Which route takes the longest time to complete one full cycle (the time it takes a bus to get back to a starting point A)? Which takes the second longest and so on? Cite statistics and present graphs that would support your answer. Think of a situation where this information might be useful.

4. Suppose someone told me that Green route buses are better at following their schedule than Red route buses. Collect and analyze data that can be used to verify or refute this claim. Explain how you collected the data and describe the data that you collected. Present graphs and statistics that would support your answer. Also, explain the potential significance of your findings.

5. Think of a reasonable question of interest about AppalCART (but **not** about the drivers or any AppalCART employees) that can be answered either by collecting your own data or by using the data located at the AppalCART website. Then either answer your question or explain a procedure for getting an answer to your question (your explanation should be clear and detailed enough that I should be able to follow and carryout your procedure).

6. A paragraph that gives a summary of what this project is all about. You can include recommendations on how you can improve your arguments on some or all issues you tackled.

7. Finally, a paragraph about how this project helps (or does not help) you in appreciating the relevance of this course. You can include some recommendations on how this project can be improved.

Evaluation - A model for evaluating the project is given at the ARTIST website http://data.gen.umn.edu/artist/glossary.html. This type of project falls under the category "Performance Task" described in the website as follows:

"A performance task is a type of authentic assessment, in that it is modeled after a real life statistical problem or task. In the ARTIST database, a performance task is an item that gives students the opportunity to demonstrate their ability to integrate and apply statistical knowledge and skills in analyzing information. It is a way for students to demonstrate their ability to think statistically and construct a solution to a problem that includes relevant information about a statistical question and is accompanied by either raw data, summary statistics, and/or discussion of design issues. The problem challenges students to select an appropriate statistical procedure, use evidence to support a statistical conclusion, consider all relevant aspects of a statistical problem, or knowledgeably critique and evaluate a problem solution. These items are best scored using a holistic rubric that focuses on the overall approach and communication as well as the problem solution. Here are some questions to consider when evaluating students' answers:

1. Was an appropriate statistical procedure used to solve this problem?
2. Were necessary assumptions tested?
3. Were statistical analyses carried out correctly?
4. Were appropriate graphs used?
5. Was the conclusion stated appropriately and in terms of the problem context?
6. Was appropriate evidence supplied to justify the conclusion?
7. Were the explanations thorough and consistent?

Each of these components could be scored on the following scale:
0 (missing or completely incorrect/not relevant to the problem)
1 partially correct
2 mostly correct
3 essentially correct"

This model can be tailored to this project as follows: In placed of the 7 questions above, the 12 items below and the scoring scale can be used.

1. The introduction clearly explains the purpose of the project.
2. The data collection methods were clearly described.
3. Appropriate graphs and numerical summaries were used.
4. All the issues were addressed.
5. Appropriate statistical procedures were used.
6. Statistical analyses were carried out correctly.
7. Conclusions were stated appropriately and in terms of the problem context.
8. Appropriate sets of evidence were supplied to justify the conclusions.
9. The explanations were thorough and consistent.
10. Technical terms were used correctly.
11. The statements were grammatically correct.
12. The project demonstrated sufficient integration of statistical knowledge.

Each of these components could be scored on the following scale:
1 Strongly Disagree
2 Disagree
3 Neither agree nor disagree
4 Agree
5 Strongly agree