Assignment 06: Bike Share Team Project

Assignment Instructions

This is a team assignment.

Purpose of this assignment Engineers often must consider data and how to explore these data to make decisions. This assignment provides an opportunity to make recommendations to a client by considering the client's needs, developing questions that can be explored through data, and answering these questions using data and inferences.

Your Task CoGo Bike Share is trying to understand the usage of the shared bicycles to help improve their bicycle sharing enterprise. Your team has been hired as a consultant to the company. Your task is to make a set of recommendations to your client that would help improve their enterprise.

a) Develop your team **collaboration plan** and write a **team problem statement**.

b) **Available data types**: Agree on your data types as a team and develop new categories of data when necessary.

c) **Prepare the data for further analysis**: Data from CoGo Bike Share can be found on Brightspace in the '**Project 2**' tab. Notice that the dataset are broken up by months of the year. Your focus will be on **March 2019 to March 2020**.

d) **Ask questions as a team to explore the available data**: As a team, develop questions that will aid in your understanding of the operation of the bike share program. Using specific investigative methodologies, explore the data to answer your team's questions.

e) **Ask questions as a team and answer your questions**: As a team, identify questions that are of significance to your client's business and the experience of the users. As a team, develop a plan to answer the questions you have chosen and implement that plan.

f) **Make recommendations to your client**: Present 2-3 recommendations to your client based on your team's analyses to answer questions about CoGo Bike Share. Include a summary of your data analysis methods, refer back to specific sections of your technical brief and appropriate visuals to help your client understand your results and your recommendations to CoGo Bike Share on how to improve their bicycle sharing program.

Relevant Course Resources:

Pre-Class Videos	• Information Literacy • Data Analytics
Course Resources	• Excel Reference 1 – Excel Basics • Excel Reference 2 – Chart Selection
Lecture Slides	• All course lectures on data analysis

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Organizing Your Work
Pay attention to how you format and organize your work in your **Technical Brief** and **Excel Spreadsheet**. Below are some general instructions:

Technical Brief:

- Follow the "Technical Brief Template."
- Complete the Technical Brief as if you were submitting to an actual client. Be professional in tone and content.
- Make sure you replace all instructional red text in the word document with your own observations, questions, answers, etc. as appropriate.

Excel Spreadsheet:

- Pay attention to how your Excel sheets are designed and organized; they should follow best practices and should be easy for others to understand and for potential collaborators to see how to modify, if necessary.
- Make sure your tables and titles, and your columns have clear labels & units. Make sure your figures have captions.
- Format your cells with reasonable decimal places and data types (In Excel right click, "Format Cells…").
- Include details on your calculations using text boxes located near the calculations you are describing. Have detailed explanations in your text boxes so that a user can easily follow along with your work presented in the spreadsheet.
- You may use other references in your analysis and your spreadsheet if you like, but they must be clearly cited.
- Give meaningful names to each sheet in your Excel document. Since you have multiple Excel sheets, make sure they are organized in very similar manners.

Submission Instructions: Complete this assignment **as a team.** One member of your team must submit your work on Brightspace, but all team members should review and approve the submission.

1. Re-name your technical brief as, **ENGR131_A06_*teamnum*.docx**, where *teamnum* is your ENGR 131 team number.
2. Save your Excel file as, **ENGR131_A06_data_*teamnum*.xlsx,** again with *teamnum* is your ENGR 131 team number.
3. As a back-up, save your files to your **Purdue Career Account, Box drive, or OneDrive** (Your Purdue Career Account is your Purdue storage space. For more information see https://www.itap.purdue.edu/connections/careeraccount)
4. Submit your work through the designated **Brightspace Assignment Drop Box at** https://purdue.brightspace.com/

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Background/Technical Content:

Bike sharing is becoming extremely popular in big cities and smaller communities alike. Bike share with stations is a form of transportation that allows users, both members and casual riders, to pick up an available bicycle at a station, ride the bicycle for a time, and return the bicycle to either the original station or another station that has an open bike slot. CoGo Bike Share is a bicycle sharing company that operates in Columbus, OH. See https://www.cogobikeshare.com/ for more information about this company, how to use the bikes, how many bikes are available, how many stations exist and where they are located, etc. Also available are the data from CoGo Bike Share that can be found at: https://s3.amazonaws.com/cogo-sys-data/index.html. For simplicity, the data needed for the investigation has been downloaded for you and is available in the assignment folder in Brightspace.

Check Your Work with the Learning Objectives

A06: Bike Share Team Assignment	
Learning Objectives Your work will be graded on demonstration of proficiency of the following learning objectives:	**Did you address this?**
I. Team Member Roles	
TW02 – Document all contributions to the team performance with evidence that these contributions are significant.	
TW04 – Develop expectations with high quality work and timely completion of team projects.	
II. Understand the Bicycle Sharing Program	
EE03 – Make connections between classwork and contemporary issues that impact or are impacted by engineering practice.	
IL02 – Gather information from reliable sources.	
IL04 – Include citations within the text (in-text citations) that show how the references at the end of the text are used as evidence to support decisions.	
IL05 – Format reference list of used sources that is traceable to original sources (APA or MLA are recommended).	
III. Problem Statement	
PS01 – Explain the problem based on synthesis of client, user, and other stakeholder needs.	

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PS02 – Justify why problem is important to solve by making reference to relevant global, societal, economic, or environmental issues.	
PS03 – Explain key specifications (in terms of criteria and constraints) that address what the client wants and what the user needs.	
IV. Understand the Data	
SQ01 – Use accurate, scientific, mathematical, and/or technical concepts, units, and/or data in solutions.	
EB02 – Identify assumptions made when there are barriers to accessing information.	
V. Identify Patterns in the Data	
DV08 – Make accurate comparisons across groups with specific reference to data.	
DV02 – Select appropriate graphical representation of dataset based on data characteristics such as numerical (discrete or continuous) or categorical (ordinal or nominal).	
DV05 – Prepare a chart for technical presentation with proper formatting, including title, axes labels, appropriately scaled axes, units, and appropriate markers.	
VI. Answer Team Questions	
DV02 – Select appropriate graphical representation of dataset based on data characteristics such as numerical (discrete or continuous) or categorical (ordinal or nominal).	
DV05 – Prepare a chart for technical presentation with proper formatting, including title, axes labels, appropriately scaled axes, units, and appropriate markers.	
SQ01 – Use accurate, scientific, mathematical, and/or technical concepts, units, and/or data in solutions.	
VII. Ask Questions	
IL01 – Ask questions to determine what new information is needed to scope and solve a problem.	
PS02 – Justify why problem is important to solve by making reference to relevant global, societal, economic, or environmental issues.	
IL03 – Support all claims made with evidence that is either generated or found.	
VIII. Recommendation to the Client	
EB03 – Clearly articulate reasons for answers with explicit reference to data to justify decisions or to evaluate alternative solutions.	

DV05 – Prepare a chart for technical presentation with proper formatting, including title, axes labels, appropriately scaled axes, units, and appropriate markers.	
PC03 – Present all visuals with captions (e.g., figure number, table number, and brief description).	
PC04 – Professional present all visual representations (figures, images, sketches, or prototypes) to clearly convey meaning by labeling key components to show their form and function.	
IL04 – Include citations within the text (in-text citations) that show how the references at the end of the text are used as evidence to support decisions.	
IX. Appendix – Excel Spreadsheet	
DV01 – Efficient use of engineering tools for basic statistics. Use of automated solutions, such as cell referencing and built in functions.	
DV04 – Prepare a table for technical presentation with proper formatting.	
DV05 – Prepare a chart for technical presentation with proper formatting, including title, axes labels, appropriately scaled axes, units, and appropriate markers.	
X. References	
IL02 – Gather information from reliable sources.	
IL04 – Include citations within the text (in-text citations) that show how the references at the end of the text are used as evidence to support decisions.	
IL05 – Format reference list of used sources that it traceable to original sources (APA recommended).	
All Deliverables	
PC01 – Use professional communication (written, visual, and oral), free of grammatical or spelling mistakes and in a formal tone, appropriate for engineering school and workplace.	
PC05 – Fully address all parts of assignment by following instructions and completing all work.	