

## ASSIGNMENT

# IDENTIFY INTERESTING TIME-SERIES PATTERNS

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**Course:** Data Communication in the Age of AI

**Institution:** University of Notre Dame

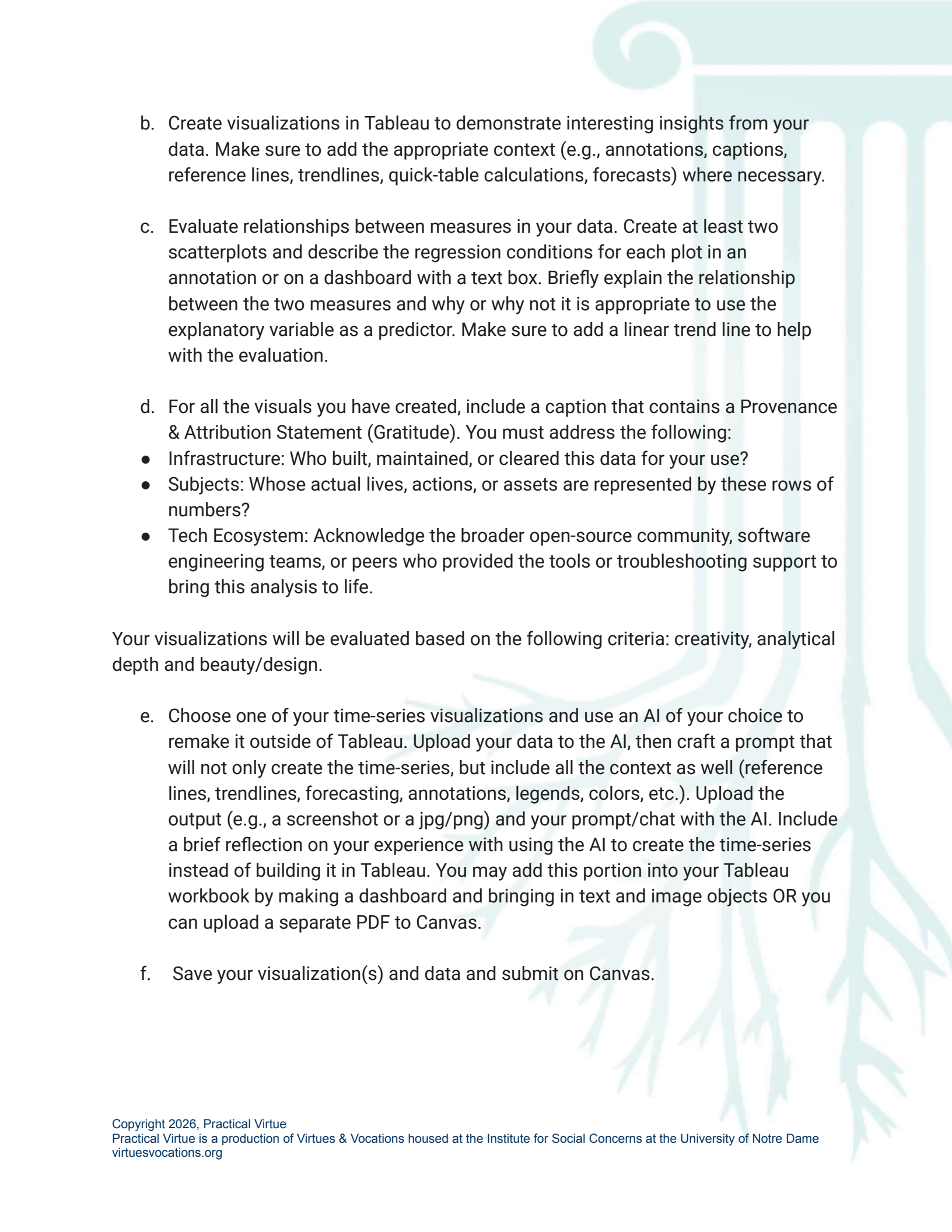
**Faculty:** Brandon Erlacher

### Details about the audience and course context

- How many students are in the class? *Approximately 30*
- What is the teaching modality (in person, virtual, hybrid)? *In person*
- What grade level/year are the majority of students? *Juniors*
- Where does this course fall in the curriculum? (Is it in the core or organized within a particular course of study?) *This is a requirement for the Business Analytics Major and Minor.*
- What virtues are integrated into the course? *humility and gratitude*

### Assignment: Identify interesting time-series patterns

- a. Collect a small dataset (100 rows) that contains a date field, at least 3 measures and other categorical fields for variables of your interest (e.g., running data where each row would contain a value for each of the following columns: date/time, heart rate, temperature, activity name, pace, stride length, weather and V02 Max.) Make sure each row of data contains a date/time. Some interests that you could collect data include: screentime, email, music listening history, sensor data from wearables, sports related stats, visually observed data points over time, financial data (banking, credit card). Then provide a brief reflection to acknowledge Data Fidelity & Limitations (Humility) with your data:
  - Blind Spots: At least two analytical questions this dataset cannot answer.
  - Assumptions: Where you had to make clean-up choices (e.g., how you handled null values, outliers, or missing data segments).
  - Potential Biases: At least one systemic limitation or potential collection bias in the underlying pipeline.

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- b. Create visualizations in Tableau to demonstrate interesting insights from your data. Make sure to add the appropriate context (e.g., annotations, captions, reference lines, trendlines, quick-table calculations, forecasts) where necessary.
  - c. Evaluate relationships between measures in your data. Create at least two scatterplots and describe the regression conditions for each plot in an annotation or on a dashboard with a text box. Briefly explain the relationship between the two measures and why or why not it is appropriate to use the explanatory variable as a predictor. Make sure to add a linear trend line to help with the evaluation.
  - d. For all the visuals you have created, include a caption that contains a Provenance & Attribution Statement (Gratitude). You must address the following:
    - Infrastructure: Who built, maintained, or cleared this data for your use?
    - Subjects: Whose actual lives, actions, or assets are represented by these rows of numbers?
    - Tech Ecosystem: Acknowledge the broader open-source community, software engineering teams, or peers who provided the tools or troubleshooting support to bring this analysis to life.

Your visualizations will be evaluated based on the following criteria: creativity, analytical depth and beauty/design.

- e. Choose one of your time-series visualizations and use an AI of your choice to remake it outside of Tableau. Upload your data to the AI, then craft a prompt that will not only create the time-series, but include all the context as well (reference lines, trendlines, forecasting, annotations, legends, colors, etc.). Upload the output (e.g., a screenshot or a jpg/png) and your prompt/chat with the AI. Include a brief reflection on your experience with using the AI to create the time-series instead of building it in Tableau. You may add this portion into your Tableau workbook by making a dashboard and bringing in text and image objects OR you can upload a separate PDF to Canvas.
- f. Save your visualization(s) and data and submit on Canvas.