Data Solutions Developer Technical Assessment

Scenario: As a Data Solutions Developer, you will be responsible for creating interactive data applications and analytics solutions that enable stakeholders to explore and understand their data effectively. For this exercise, you will demonstrate your ability to transform raw survey data into an actionable proof-of-concept application.

Assessment Task: You have been provided with student orientation data from 2023. Your task is to:

1. Develop a proof-of-concept data application that allows users to:
    - Explore key metrics through interactive visualizations
    - Filter and segment data based on demographic variables
2. Prepare a 15-minute technical presentation covering:
    - Your data analysis approach and methodology
    - The technical architecture of your proposed solution
    - Key features of your proof-of-concept application
    - Rationale for chosen visualizations and interactive elements
    - Potential scalability and enhancement opportunities

Technical Deliverables:

1. A working proof-of-concept application (can be built using Python/R Shiny or similar framework of choice)
2. 2-3 interactive data visualizations demonstrating:
    - Data relationships and patterns
    - User interaction capabilities
3. Code repository with:
    - Data preprocessing scripts
    - Application source code
    - Documentation of setup and deployment steps

Technical Considerations:

- Data cleaning and preprocessing approach
- Choice of visualization libraries and frameworks
- Implementation of interactive features
- Performance optimization strategies
- Data security and privacy measures

Important Note: You do not need to publish or deploy your application prior to the presentation. Instead, be prepared to run the application locally during your presentation and use it to guide an interactive discussion about your technical choices and analysis approach. You have flexibility in selecting which survey questions and demographic variables to focus on -

choose those that best demonstrate your technical capabilities and provide meaningful insights for stakeholders.

Scenario File Descriptions:

- **2023 Incoming Student Survey Instrument:** This document contains the questions and response options from the Binghamton Orientation survey. Only a subset of the questions in this document have been provided in the data file. This survey is administered annually to all incoming undergraduate students the summer before their first fall semester. (File name: 2023_Incoming_Student_Survey Instrument.docx)
- **2023 Orientation Survey Dataset:** This dataset contains a simulated version of survey data from the Binghamton Orientation survey. While the data are fictional, they share the same structure and properties of the actual data. Additional information about the questions administered on the survey can be found in the survey instrument document. Only a subset of the questions from the survey have been included in this file. (File name: or_survey_sim_final_2023-11-29.xlsx)
- **Student Demographic Information Dataset:** This dataset contains a simulated version of some standard student demographic data. While the data are fictional, they share the same structure and properties of the actual data. This includes both the students that completed the survey and those that did not. The actual identifiers have been masked, but can be used to link the datasets. (File name: pde_sim_final_2023-11-29.xlsx)