Individual Assignment

General Instructions

Please read carefully: You are to work strictly individually on this assignment. You should not communicate or exchange any information (electronic or other, directly or indirectly) with anyone about this assignment, nor use any generative AI tools. Read the assignment entirely, including the instructions at the end, before starting to work. Provide explanations for your answers to the questions.

Due date: The assignment is due on Friday 4 October, 11:59 pm ET.

What to turn in: Please submit a Jupyter Notebook file containing all your work, as detailed in "Instructions" at the end. At the top of your answer notebook, type the following statement as Markdown: "I, your full name, attest that I did not receive or give any help in working on this assignment."

How to turn in your work: Submit your work on Blackboard by clicking on "**Assignment**" at the left pane menu. If you submit your work two times, only your last submission will be considered.

Automobile Phillips *[20 points]*

Automobile Phillips manufactures both vans and luxury cars, targeting high-income men and women as their primary customer base. To effectively reach these audiences, the company has launched an ambitious advertising campaign, purchasing 1-minute commercial spots on two types of TV programs: football games and comedy shows.

- Each football game commercial reaches 6 million high-income men and 3 million high-income women.
- Each comedy show commercial reaches 4 million high-income men and 8 million high-income women.

The cost for a 1-minute ad is $110,000 for football games and $70,000 for comedy shows. Automobile Phillips aims to ensure that their ads are seen by at least 26 million high-income men and 32 million high-income women.

Using Python linear programming, determine how the company can meet its advertising reach goals at the minimum cost.

a) Formulate a decision model to determine an efficient advertisement plan. Clearly indicate the model elements and the settings that you declared. *[6 points]*

b) What is the recommended policy? *[4 points]*

c) What is the optimal solution to the problem and why? *[6 points]*

d) Automobile Phillips have pushed for further reducing the advertisement costs down by 15% of the total spent. What would happen then? Suggest at least one change in the model that could be made to allow for the proposed reduction in advertisement costs. *[4 points]*

Instructions. *Prepare a Jupyter Notebook file showing your model and answers to the questions all in one notebook. Type your answers and explanations in the notebook's cells. Clearly identify your answers by question number.*

When you are done with your work, include the honor code statement at the top of your file.

---------- END OF INDIVIDUAL ASSIGNMENT ----------