Math 308 Fall 2023 – Final Project

General Guidelines:

In this project, you will read the martial uploaded to the canvas page in the "General Information" folder and develop a model for a special diet problem. In your diet problem, the food items are to be selected from anything available at the Food Court of the central city mall and the planning horizon is one week. A minimum of three meals is required each day and a maximum of five. Identify the nutritional requirements by considering various aspects: variety of food items (e.g., types of vegetables, fruits, grains, meat, milk, egg etc.), discuss your goal (minimize cost while taking a specified upper limit on calorie), total calorie each day, variety of food items (e.g., reduce repetitions) etc. and use your creativity in introducing appropriate constraints so that a good problem and model is developed.

Solve the model using Microsoft Excel or Gurobi. You may also use open solver if your model is larger, and Microsoft excel solver cannot handle it. Open solver works like Microsoft excel solver but have no restrictions on the number of variables and constraints and it is free to download.

The project report must start with an abstract followed by an introduction section explaining the problem without too much technical contents. Then develop a linear (integer) programming model. Present this model along with all details including meaning of variables etc. in section 2 with the title "Model Development". In section 3, discuss how you collected your data under the section title "Data Collection". Then in section 4, present "Experimental Results" followed by a "conclusion Section". Include all references and cite them appropriately.

Evaluation:

The project is worth 15% of your final grade. Presentation and accuracy of the report (as discussed above) worth 10 points and creativity in model development worth 5 points. Include your excel/Gurobi model and results in the experimental results section. You can use integer or binary variables as necessary along with continuous variables.

You can work on the project in groups or individually. A group cannot have more than 4 students. All group members will receive the same mark. It is your responsibility to select your group, if applicable, and manage the group activities.

The final report must me uploaded to crowdmark no later than December 3, 11:30 pm. Use a cover page indicating the project title, author names and student numbers. Late reports will not be accepted. Project report should not be more than 5 pages.

Plagiarism in any way will result in zero points. Each group is supposed to work independently and copying, if detected, will result in zero points for all involved.