CMSC 150 1st Semester 2019-20 **Final Project Specification**

A. GENERIC SOLVERS

CSV input

Quadratic Spline Interpolation (QSI)

EXPECTED OUTPUTS

f(x) per interval and Correct f(x) for the estimate

Polynomial Regression (PR)

EXPECTED OUTPUTS

f(x) and estimate

B. Simplex Implementation

ASSESSING THE VALUE OF SUPPLY CHAIN MANAGEMENT
OPTIMIZING SHIPMENTS

Background of the study

One of the main products of the Fairway Woods Company is custom-made golf clubs. The clubs are manufactured at three plants (Denver, Colorado; Phoenix, Arizona; and Dallas, Texas) and are then shipped by truck to five distribution warehouses in Sacramento, California; Salt Lake City, Utah; Albuquerque, New Mexico; Chicago, Illinois; and New York City, New York. Because shipping costs are a major expense, management is investigating a way to reduce them. For the upcoming golf season, an estimate has been created as to the total output needed from each manufacturing plant and how each warehouse will require satisfying its customers. The CIO from Fairway Woods Company has created a spreadsheet of the shipping costs from each manufacturing plant to each warehouse as a baseline analysis.

Fairways Woods Company Shipping Analysis						
		Number to ship from plant to warehouse:				
Plants	Total					
Denver	0	0	0	0	0	0
Phoenix	0	0	0	0	0	0
Dallas	0	0	0	0	0	0
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Totals:		0	0	0	0	0
	Demands by	180	80	200	160	220
Plants	Supply	Shipping costs from plant to warehouse:				
Denver	310	10	8	6	5	4
Phoenix	260	6	5	4	3	6
Dallas	280	3	4	5	5	9
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Shipping:	$0	$0	$0	$0	$0	$0

Optimization

Optimization – These problems involve determining the function/equations corresponding to:

Main Goal: Minimize total shipping cost.
Restrictions/Requirements:

- Total shipped must be less than or equal to supply at plant.
- Total shipped to warehouses must be greater than or equal to demand at warehouses.
- Number to ship must be greater than or equal to 0.

C. Project Requirements

Make sure to be provide a graphical user interface that would facilitate easy uploading of inputs for the generic solvers.
An interface must also be provided to easily change the constraints and objective function for the optimization problem.
There must be an option to display or hide the tableau and basic solution (initial and per iteration).
All functionalities must be in one system/program.
Any programming language (or combination) may be used.
Use of built-in functions of CMSC 150 Methods (Simplex, Gauss-Jordan, Regression, etc.) are NOT ALLOWED. These functions should be implemented from scratch.
Prepare a printed User's Manual containing information about your system. The manual must contain How To Use, About, and other sections that are useful to the users.

Presentation Date: TBA (depends on lab section), before CMSC 150 Final Exam