

# CMSC 150 Project User Manual

An RShiny Application

## Features:

### Generic Solvers

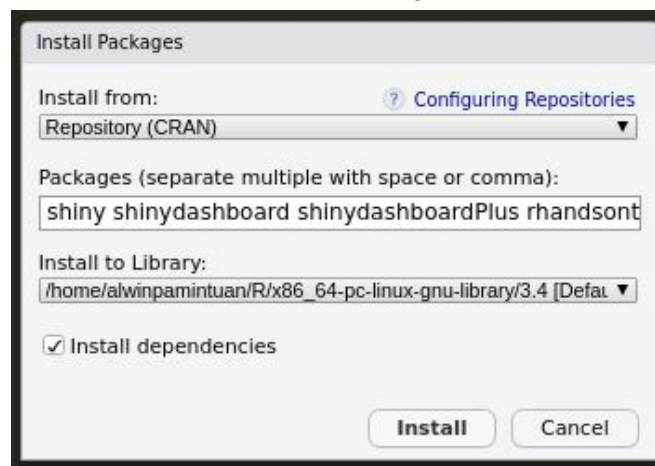
- Polynomial Regression
- Quadratic Spline Interpolation

### Simplex Implementation

- Assessing the value of supply chain management, optimizing shipments

## Running the shiny app:

- > Before beginning, see to it that all files (app.R, simplex.R, polynomialregression.R, and qsi.R) are in the same folder.
- > To run the shiny app, make sure that the following programs are installed:
  - R (download at <https://cran.rstudio.com/>)
  - RStudio (download at <https://rstudio.com/products/rstudio/download/>)
- > After installing the necessary programs, open RStudio.
- > Under the 'Tools' menu bar, choose 'Install Packages'.



- > Under Packages, type the following (*without quotation marks*):

“shiny shinydashboard shinydashboardPlus rhandsontable”

This will install the required packages for the program.

- > On RStudio, go to File > Open File then locate and choose “app.R”
- > Finally, click on the Run App button to run the shiny application.

## Using the shiny app:

The app has three tabs — Polynomial Regression, Quadratic Spline Interpolation, and Simplex Implementation. Choose any operation you desire.

Under ***Polynomial Regression***, the user must upload a csv file containing the data points. After uploading an appropriate csv file, the ***Degree*** slider would update to show the maximum degree of the regression polynomial. Use the slider input to view the generated polynomials at n degree under the ***Function*** text box. Lastly, enter the desired x at the ***Estimate*** input box to evaluate x at the nth degree polynomial as specified.

Under ***Quadratic Spline Interpolation***, the user must also upload an appropriate csv file containing the data points. This time, the ***Interval*** slider would update to show the number of function intervals created. Change the slider value to view the different functions per interval. Lastly, enter the desired x at the ***Value*** input box to determine at what interval x is located and the estimated value of x.

Under ***Simplex Implementation***, an editable table is provided for easier manipulation of the cost matrix, the demand of each plant, and the supply at each warehouse. To compute for the minimum shipping cost, click on the ***Compute*** button located at the bottom right of the screen. This will generate the initial tableau and basic solution as well as show the minimum cost. The ***Iteration*** slider will also update its maximum value depending on the number of iterations done during the simplex method. Use this to view the tableau and basic solution per ith iteration.

## About:

This shiny application is developed by John Alwin Pamintuan, a BS Computer Science undergraduate of the University of the Philippines - Los Baños, as partial fulfillment for the requirement in CMSC 150 Numerical Methods in Computer Science under Dr. Maria Art Antonette Clariño and Mr. Lei Kristoffer Lactuan.