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CMSC 150 X2L
Exercise 10

Files needed:

1. ResuelloEx08.R
2. Resuello09.R

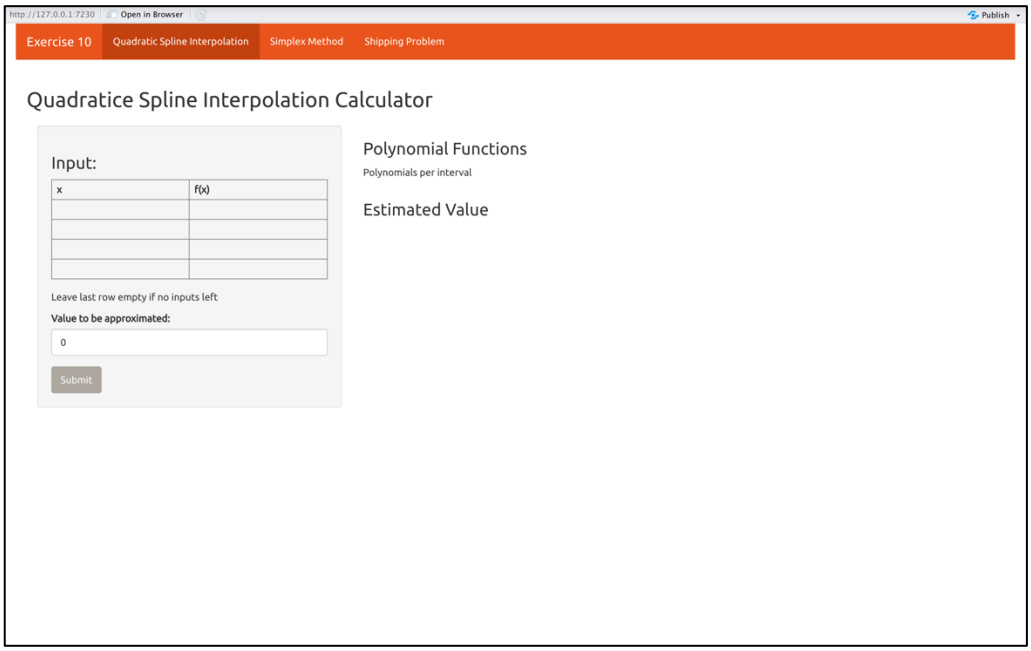
Import for R Shiny

1. R Shiny
2. R Shiny Themes
3. R Shiny Matrix

How to run app?

1. Install the needed packages
2. Click Run App

User interface when the app is run.



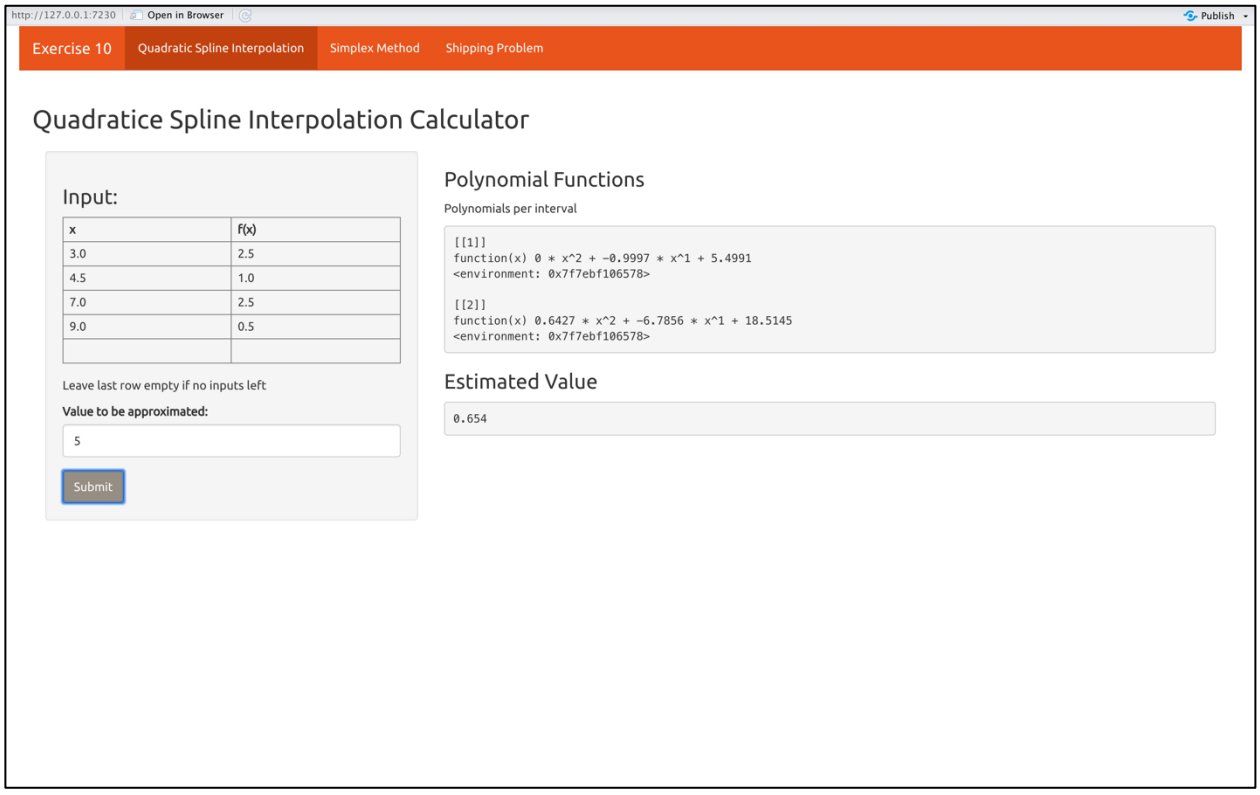
Navigation Panels

The three panels are Quadratic Spline Interpolation, Simplex Method, and Shipping Problem panels. When clicked, the specific calculator or page is shown.

Quadratic Spline Interpolation Panel

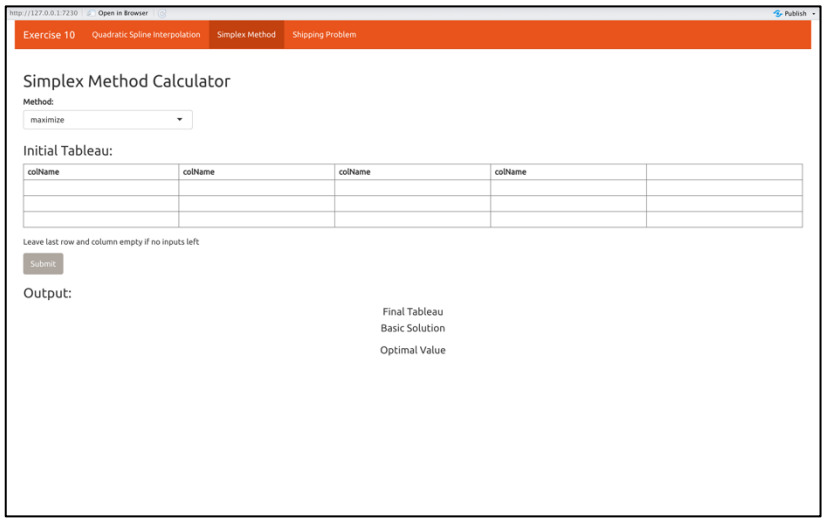
In the sidebar panel, enter the value to be estimated and the x and y numbers. A new row will automatically generate once all the existing rows are filled. If no inputs left, just leave the row empty.

Once all inputs are inputted, click the Submit button to perform the necessary calculation and show the output. The output will be shown in the main panel.

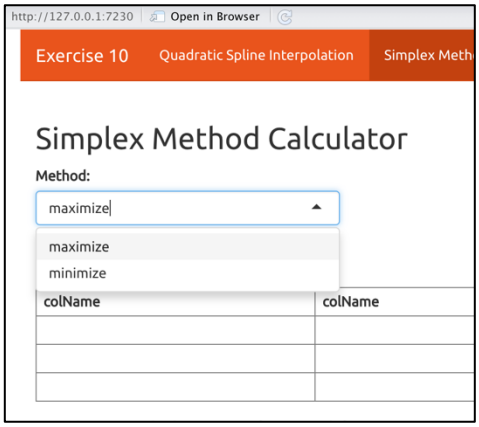


Simplex Method Panel

When the Simplex Method panel is clicked, you will see the simplex method calculator page.

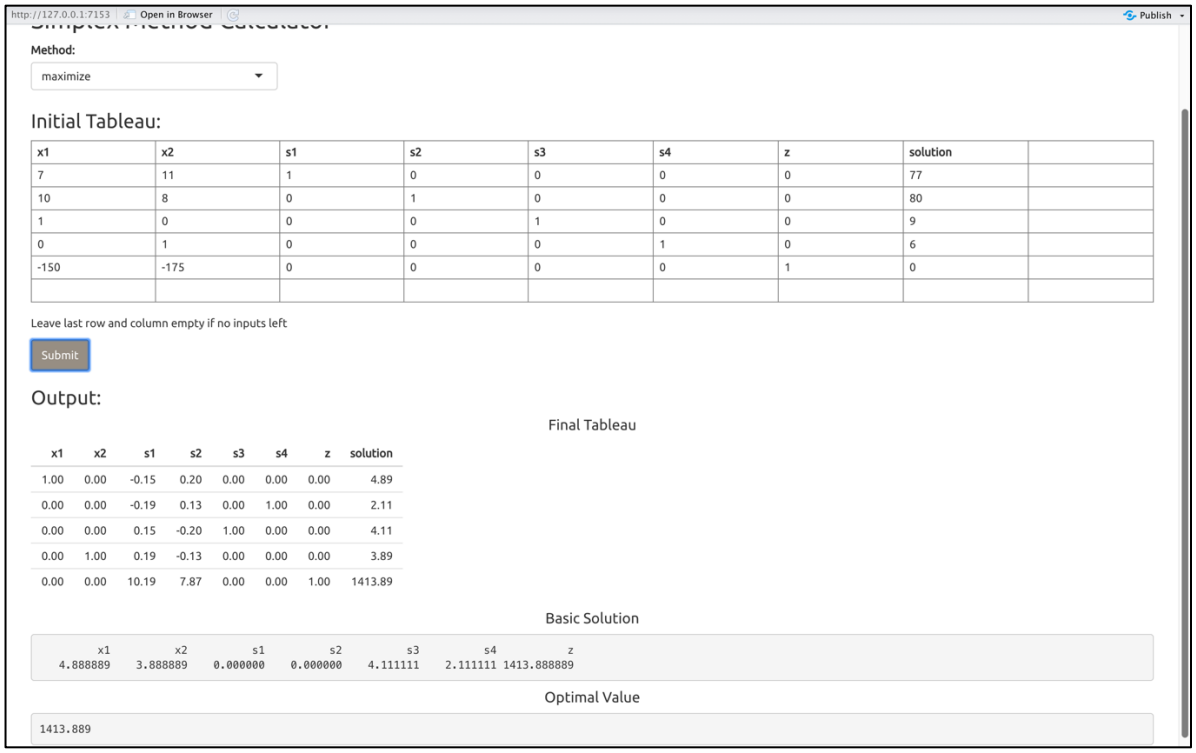


Choose the method you want to perform by clicking the dropdown box.



Input the numeric values in the matrix. Change the column names with the needed variables or names. The rows and column will automatically generate once all existing rows or columns are filled. If no inputs left, leave the last row and column empty. Once the submit button is clicked, the outputs—final tableau, basic solution, and optimal value will be shown below the submit button.

Simplex Method Maximization Sample Run



Method:

maximize

Initial Tableau:

x1	x2	s1	s2	s3	s4	z	solution	
7	11	1	0	0	0	0	77	
10	8	0	1	0	0	0	80	
1	0	0	0	1	0	0	9	
0	1	0	0	0	1	0	6	
-150	-175	0	0	0	0	1	0	

Leave last row and column empty if no inputs left

Submit

Output:

Final Tableau

x1	x2	s1	s2	s3	s4	z	solution
1.00	0.00	-0.15	0.20	0.00	0.00	0.00	4.89
0.00	0.00	-0.19	0.13	0.00	1.00	0.00	2.11
0.00	0.00	0.15	-0.20	1.00	0.00	0.00	4.11
0.00	1.00	0.19	-0.13	0.00	0.00	0.00	3.89
0.00	0.00	10.19	7.87	0.00	0.00	1.00	1413.89

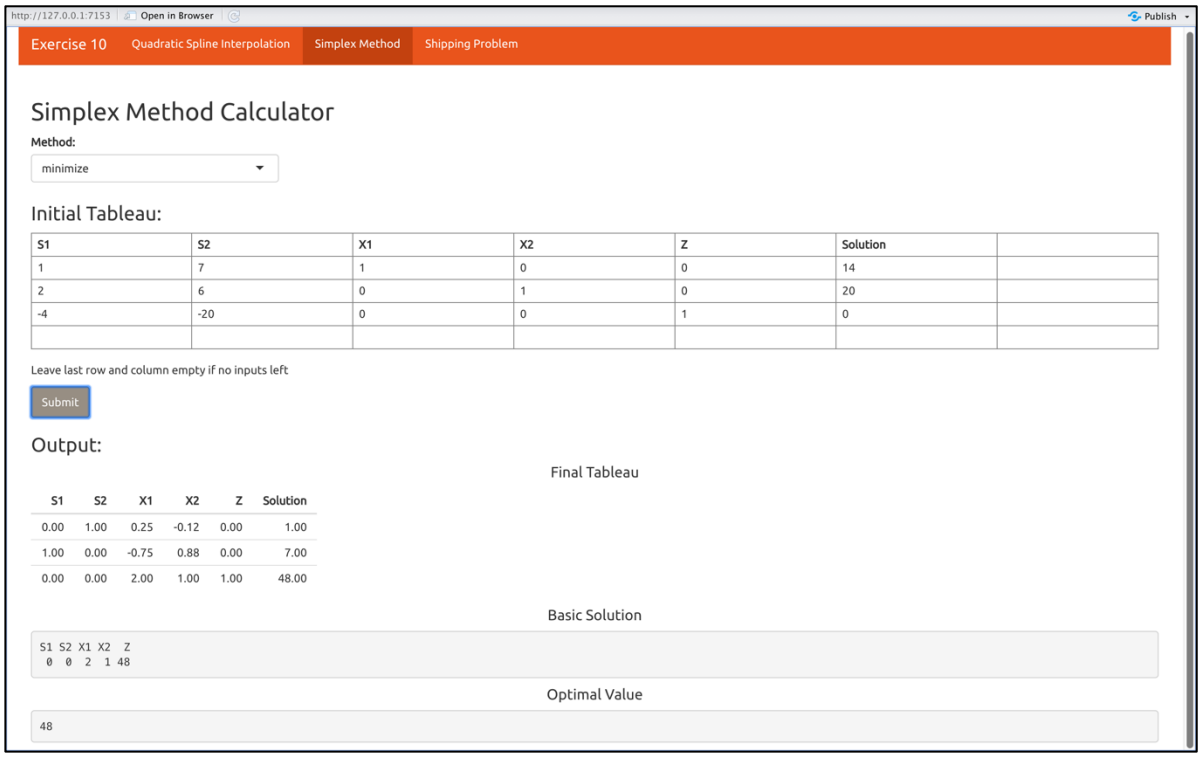
Basic Solution

```
       x1        x2        s1        s2        s3        s4         z
 4.888889  3.888889  0.000000  0.000000  4.111111  2.111111 1413.888889
```

Optimal Value

```
1413.889
```

Simplex Method Minimization Sample Run



Exercise 10 | Quadratic Spline Interpolation | Simplex Method | Shipping Problem

Simplex Method Calculator

Method:

minimize

Initial Tableau:

S1	S2	X1	X2	Z	Solution	
1	7	1	0	0	14	
2	6	0	1	0	20	
-4	-20	0	0	1	0	

Leave last row and column empty if no inputs left

Submit

Output:

Final Tableau

S1	S2	X1	X2	Z	Solution
0.00	1.00	0.25	-0.12	0.00	1.00
1.00	0.00	-0.75	0.88	0.00	7.00
0.00	0.00	2.00	1.00	1.00	48.00

Basic Solution

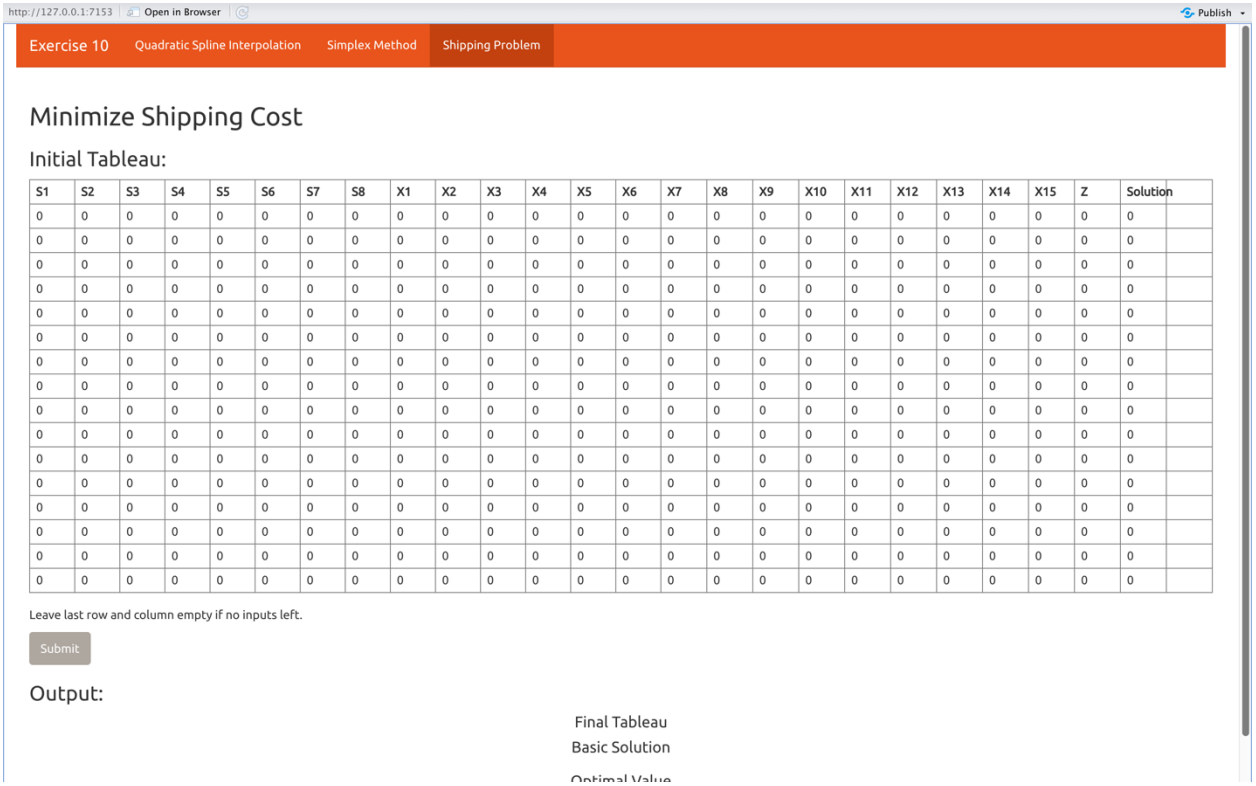
```
S1 S2 X1 X2  Z
 0  0  2  1 48
```

Optimal Value

```
48
```

Shipping Problem Panel

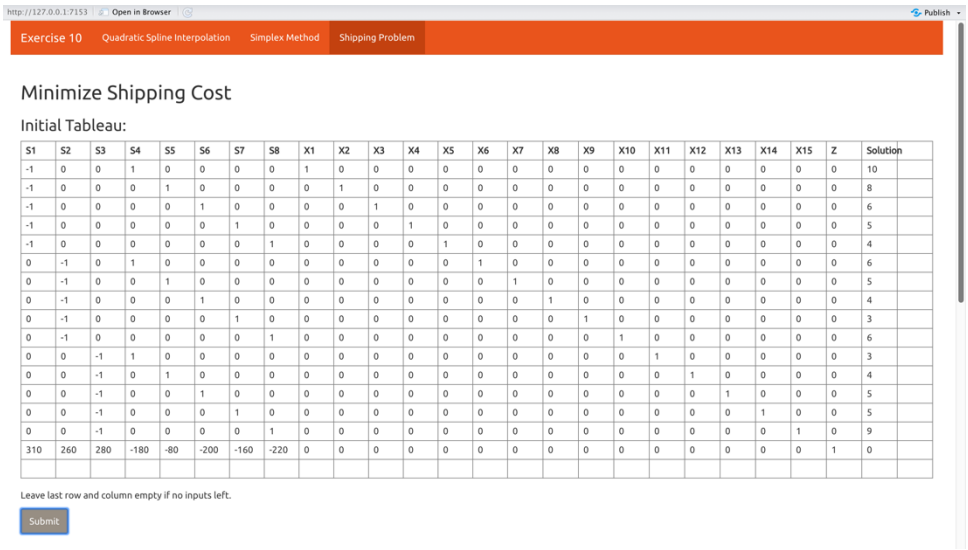
When the Shipping Problem panel is clicked, you will see the page for minimizing the shipping cost calculator.



Input the numeric values in the matrix. The rows and column will automatically generate once all existing rows or columns are filled. If no inputs left, leave the last row and column empty. Once the submit button is clicked, the outputs—final tableau, basic solution, optimal value, and number of shipped items matrix will be shown below the submit button.

Shipping Problem Sample Run

Inputs:



Outputs: