USER'S GUIDE FOR

QUADRATIC SPLINE INTERPOLATION AND SIMPLEX METHOD APPLICATION

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CMSC 150-X1L

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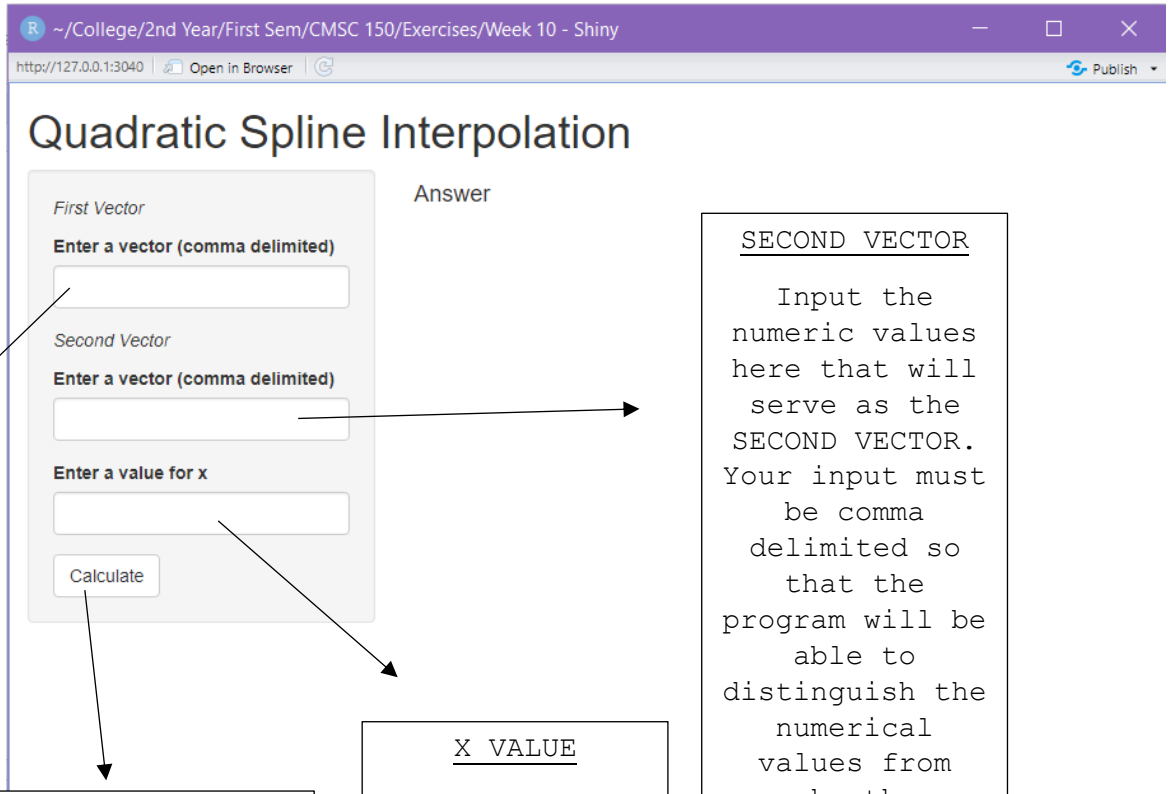
QUADRATIC SPLINE INTERPOLATION APPLICATION



FIRST VECTOR

Input the numeric values here that will serve as the FIRST VECTOR. Your input must be comma delimited so that the program will be able to distinguish the numerical values from each other.

SECOND VECTOR

Input the numeric values here that will serve as the SECOND VECTOR. Your input must be comma delimited so that the program will be able to distinguish the numerical values from each other.

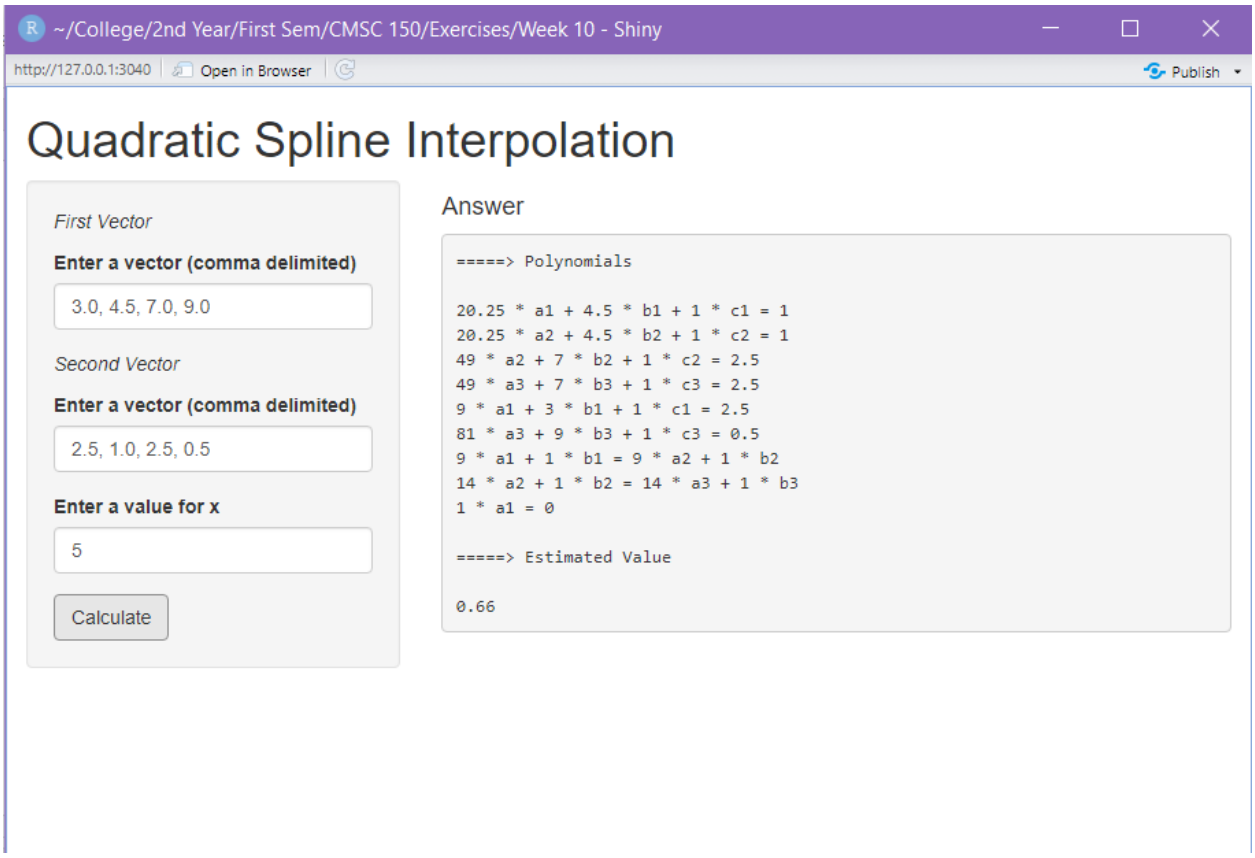
CALCULATE BUTTON

This button calculates using Quadratic Spline Interpolation and shows the result on the main panel

X VALUE

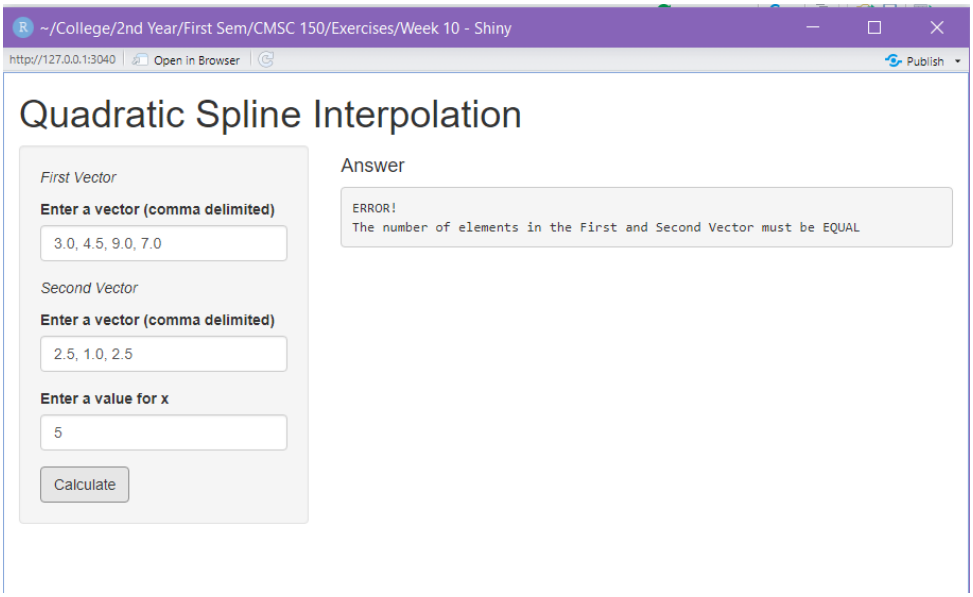
Input the x value here that will be used to approximate the value of $f_n(x)$

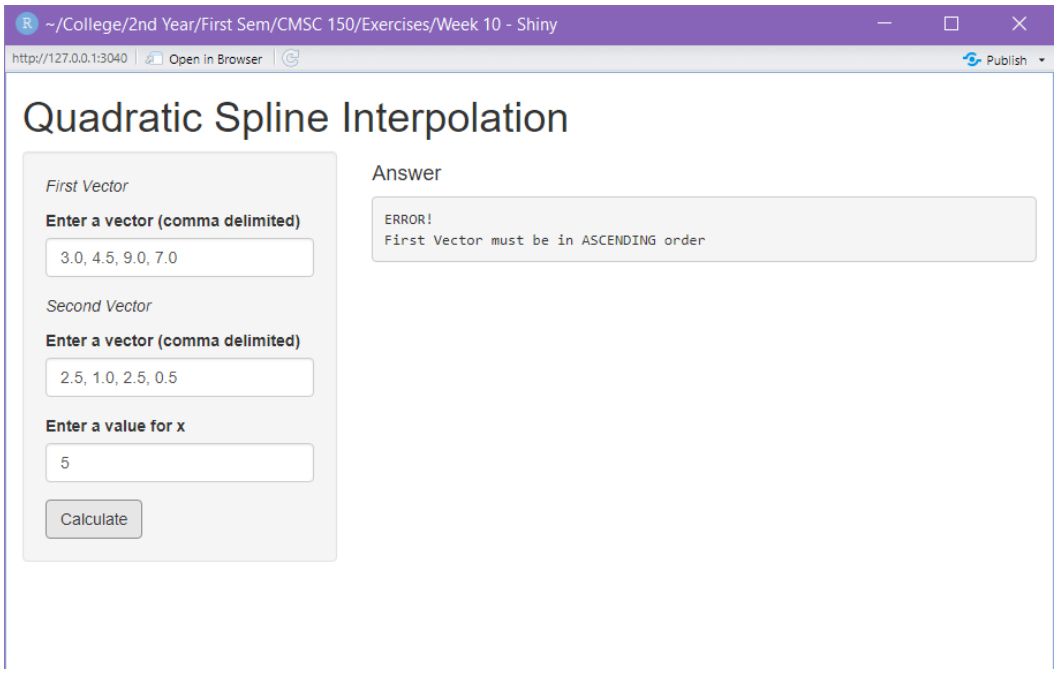
Sample Run:

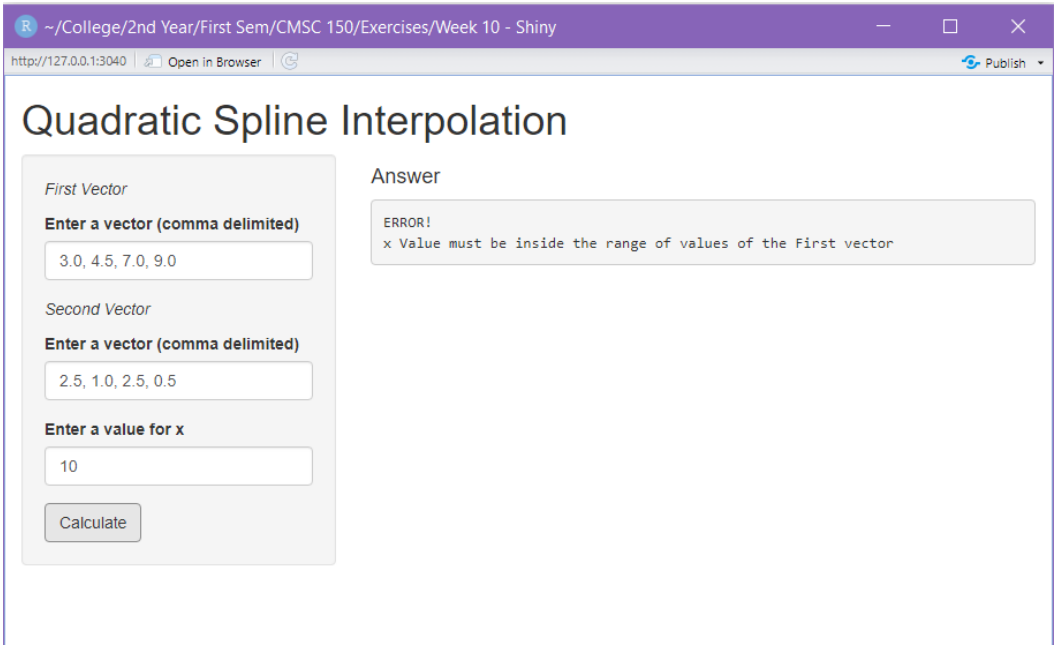

~/College/2nd Year/First Sem/CMSC 150/Exercises/Week 10 - Shiny
http://127.0.0.1:3040
Open in Browser
Publish
Quadratic Spline Interpolation
First Vector
Enter a vector (comma delimited)
3.0, 4.5, 7.0, 9.0
Second Vector
Enter a vector (comma delimited)
2.5, 1.0, 2.5, 0.5
Enter a value for x
5
Calculate
Answer
=====> Polynomials
20.25 * a1 + 4.5 * b1 + 1 * c1 = 1
20.25 * a2 + 4.5 * b2 + 1 * c2 = 1
49 * a2 + 7 * b2 + 1 * c2 = 2.5
49 * a3 + 7 * b3 + 1 * c3 = 2.5
9 * a1 + 3 * b1 + 1 * c1 = 2.5
81 * a3 + 9 * b3 + 1 * c3 = 0.5
9 * a1 + 1 * b1 = 9 * a2 + 1 * b2
14 * a2 + 1 * b2 = 14 * a3 + 1 * b3
1 * a1 = 0
=====> Estimated Value
0.66

Warnings the user may encounter:

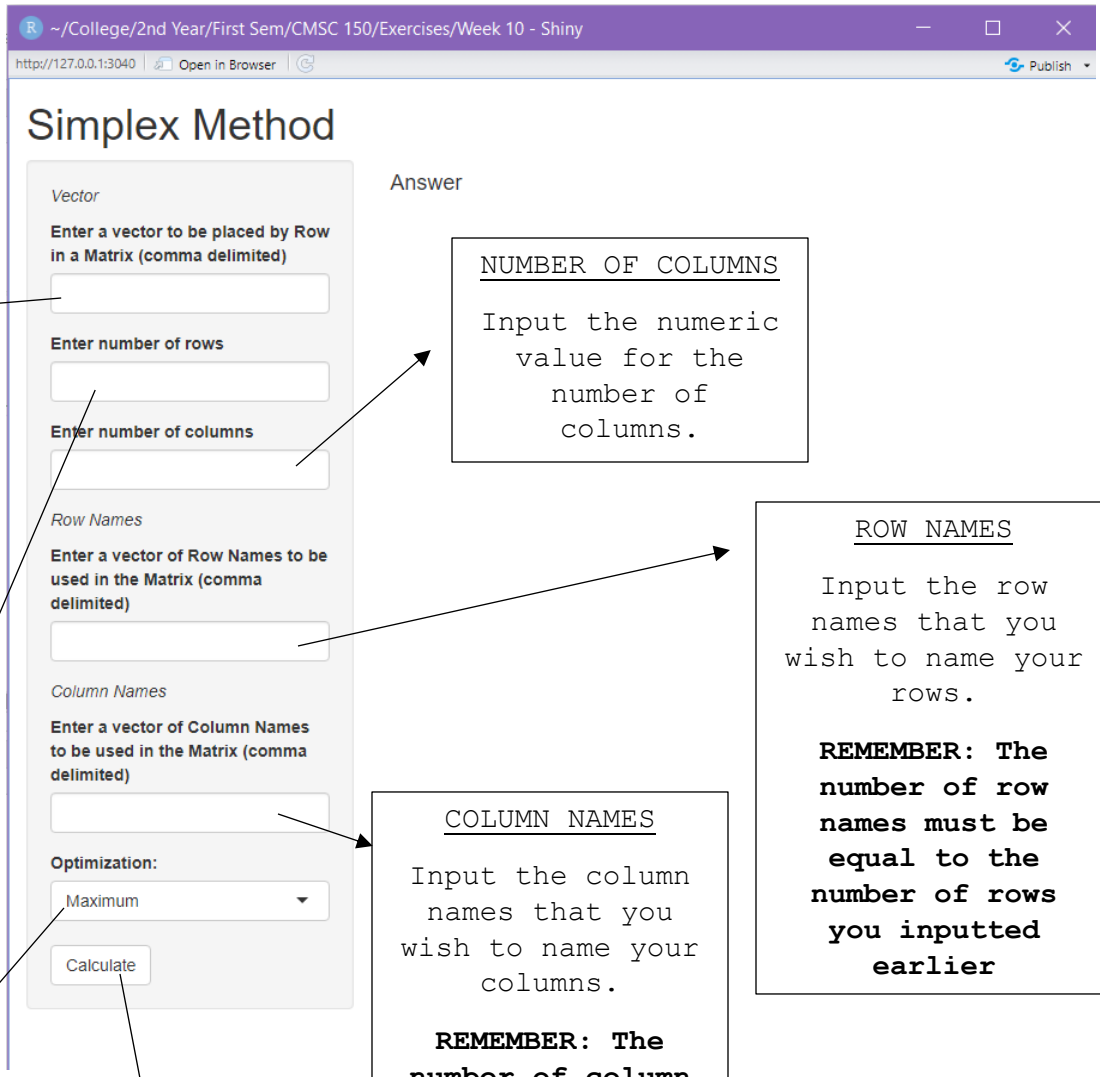
Quadratic Spline Interpolation follows some rules regarding the data that needs to be calculated. The message that can be seen on the main panel is the error in the input that the user needs to fix.

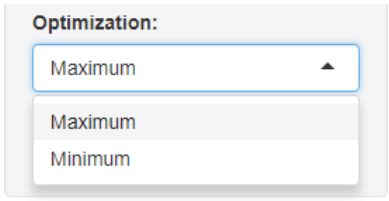



~/College/2nd Year/First Sem/CMSC 150/Exercises/Week 10 - Shiny
http://127.0.0.1:3040
Open in Browser
Publish
Quadratic Spline Interpolation
First Vector
Enter a vector (comma delimited)
3.0, 4.5, 9.0, 7.0
Second Vector
Enter a vector (comma delimited)
2.5, 1.0, 2.5, 0.5
Enter a value for x
5
Calculate
Answer
ERROR!
First Vector must be in ASCENDING order


~/College/2nd Year/First Sem/CMSC 150/Exercises/Week 10 - Shiny
http://127.0.0.1:3040
Open in Browser
Publish
Quadratic Spline Interpolation
First Vector
Enter a vector (comma delimited)
3.0, 4.5, 7.0, 9.0
Second Vector
Enter a vector (comma delimited)
2.5, 1.0, 2.5, 0.5
Enter a value for x
10
Calculate
Answer
ERROR!
x Value must be inside the range of values of the First vector

SIMPLEX METHOD





VECTOR

Input the numeric values here that will be placed BY ROW in a matrix. This will serve as the initial tableau.

NUMBER OF ROWS

Input the numeric value for the number of rows.

NUMBER OF COLUMNS

Input the numeric value for the number of columns.

ROW NAMES

Input the row names that you wish to name your rows.

REMEMBER: The number of row names must be equal to the number of rows you inputted earlier

COLUMN NAMES

Input the column names that you wish to name your columns.

REMEMBER: The number of column names must be equal to the number of columns you inputted earlier

OPTIMIZATION

Choose from the dropdown selection to perform the decided optimization technique

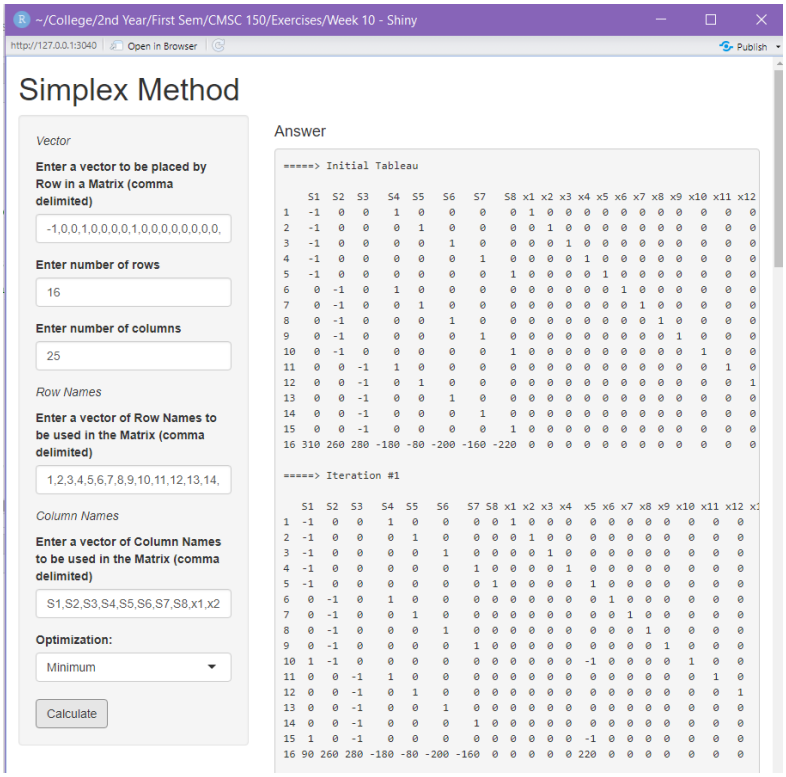
CALCULATE BUTTON

This button calculates using Quadratic Spline Interpolation and shows the result on the main panel

Sample Run:

(results may appear to be cut off, but the user can scroll the UI sideways for them to see the matrix clearly)

Test case 1



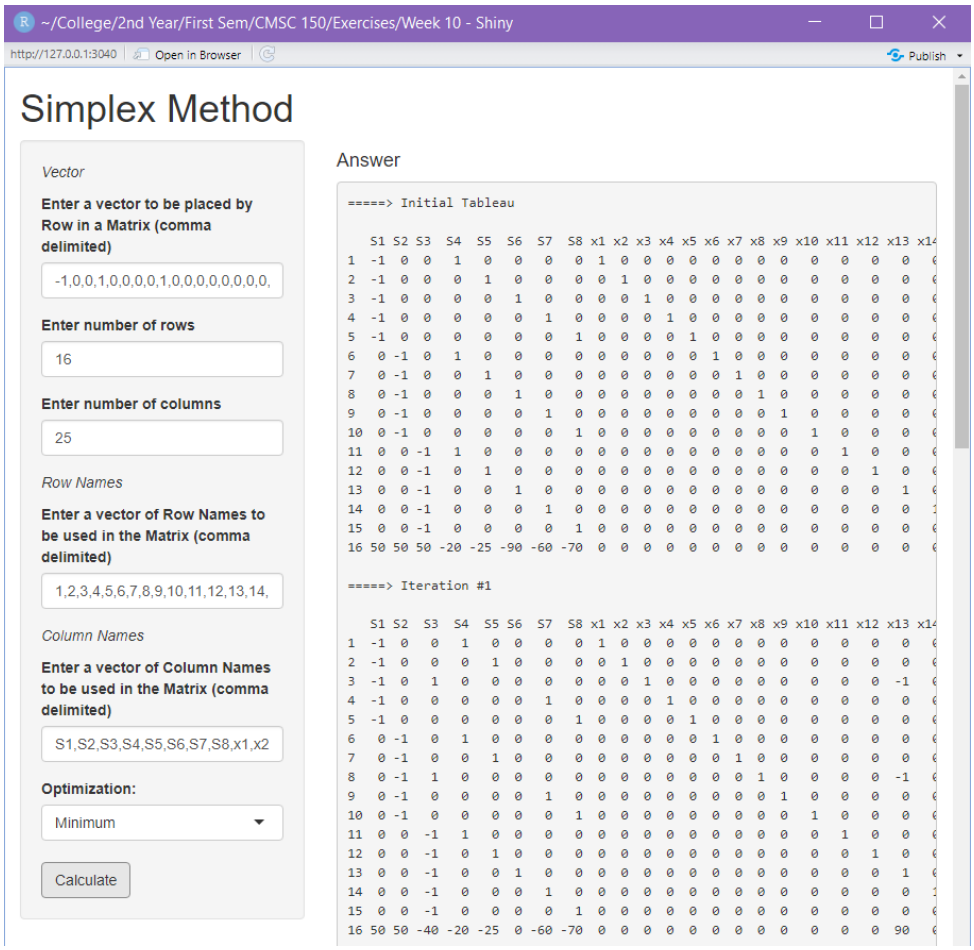

```
=====> Iteration #2

   S1 S2  S3   S4  S5 S6   S7 S8 x1 x2 x3 x4  x5 x6 x7  x8 x9 x10 x11 x12 x13
1  -1  0   0    1   0  0    0  0  1  0  0  0   0  0  0   0  0   0   0   0   0
2  -1  0   0    0   1  0    0  0  0  1  0  0   0  0  0   0  0   0   0   0   0
3  -1  1   0    0   0  0    0  0  0  0  1  0   0  0  0  -1  0   0   0   0   0
4  -1  0   0    0   0  0    1  0  0  0  0  1   0  0  0   0  0   0   0   0   0
5  -1  0   0    0   0  0    0  1  0  0  0  0   1  0  0   0  0   0   0   0   0
6   0 -1   0    1   0  0    0  0  0  0  0  0   0  1  0   0  0   0   0   0   0
7   0 -1   0    0   1  0    0  0  0  0  0  0   0  0  1   0  0   0   0   0   0
8   0 -1   0    0   0  1    0  0  0  0  0  0   0  0  0   1  0   0   0   0   0
9   0 -1   0    0   0  0    1  0  0  0  0  0   0  0  0   0  1   0   0   0   0
10  1 -1   0    0   0  0    0  0  0  0  0  0  -1  0  0   0  0   1   0   0   0
11  0  0  -1    1   0  0    0  0  0  0  0  0   0  0  0   0  0   0   1   0   0
12  0  0  -1    0   1  0    0  0  0  0  0  0   0  0  0   0  0   0   0   1   0
13  0  1  -1    0   0  0    0  0  0  0  0  0   0  0  0  -1  0   0   0   0   1
14  0  0  -1    0   0  0    1  0  0  0  0  0   0  0  0   0  0   0   0   0   0
15  1  0  -1    0   0  0    0  0  0  0  0  0  -1  0  0   0  0   0   0   0   0
16 90 60 280 -180 -80  0 -160  0  0  0  0  0 220  0  0 200  0   0   0   0   0

=====> Iteration #3

   S1 S2  S3 S4  S5 S6   S7 S8 x1 x2 x3 x4  x5 x6 x7  x8 x9 x10 x11 x12 x13 x1
1  -1  0   1  0   0  0    0  0  1  0  0  0   0  0  0   0  0   0  -1   0   0
2  -1  0   0  0   1  0    0  0  0  1  0  0   0  0  0   0  0   0   0   0   0
3  -1  1   0  0   0  0    0  0  0  0  1  0   0  0  0  -1  0   0   0   0   0
4  -1  0   0  0   0  0    1  0  0  0  0  1   0  0  0   0  0   0   0   0   0
5  -1  0   0  0   0  0    0  1  0  0  0  0   1  0  0   0  0   0   0   0   0
6   0 -1   1  0   0  0    0  0  0  0  0  0   0  1  0   0  0   0  -1   0   0
7   0 -1   0  0   1  0    0  0  0  0  0  0   0  0  1   0  0   0   0   0   0
8   0 -1   0  0   0  1    0  0  0  0  0  0   0  0  0   1  0   0   0   0   0
9   0 -1   0  0   0  0    1  0  0  0  0  0   0  0  0   0  1   0   0   0   0
10  1 -1   0  0   0  0    0  0  0  0  0  0  -1  0  0   0  0   1   0   0   0
11  0  0  -1  1   0  0    0  0  0  0  0  0   0  0  0   0  0   0   1   0   0
12  0  0  -1  0   1  0    0  0  0  0  0  0   0  0  0   0  0   0   0   1   0
13  0  1  -1  0   0  0    0  0  0  0  0  0   0  0  0  -1  0   0   0   0   1
14  0  0  -1  0   0  0    1  0  0  0  0  0   0  0  0   0  0   0   0   0   0
15  1  0  -1  0   0  0    0  0  0  0  0  0  -1  0  0   0  0   0   0   0   0
16 90 60 100  0 -80  0 -160  0  0  0  0  0 220  0  0 200  0   0 180   0   0
```

```
=====> Iteration #4

   S1   S2  S3 S4  S5 S6 S7 S8 x1 x2 x3 x4  x5 x6 x7  x8  x9 x10 x11 x12 x13 x
1  -1    0   1  0   0  0  0  0  1  0  0  0   0  0  0   0   0   0  -1   0   0
2  -1    0   0  0   1  0  0  0  0  1  0  0   0  0  0   0   0   0   0   0   0
3  -1    1   0  0   0  0  0  0  0  0  1  0   0  0  0  -1   0   0   0   0   0
4  -1    1   0  0   0  0  0  0  0  0  0  1   0  0  0   0  -1   0   0   0   0
5  -1    0   0  0   0  0  0  1  0  0  0  0   1  0  0   0   0   0   0   0   0
6   0   -1   1  0   0  0  0  0  0  0  0  0   0  1  0   0   0   0  -1   0   0
7   0   -1   0  0   1  0  0  0  0  0  0  0   0  0  1   0   0   0   0   0   0
8   0   -1   0  0   0  1  0  0  0  0  0  0   0  0  0   1   0   0   0   0   0
9   0   -1   0  0   0  0  1  0  0  0  0  0   0  0  0   0   1   0   0   0   0
10  1   -1   0  0   0  0  0  0  0  0  0  0  -1  0  0   0   0   1   0   0   0
11  0    0  -1  1   0  0  0  0  0  0  0  0   0  0  0   0   0   0   1   0   0
12  0    0  -1  0   1  0  0  0  0  0  0  0   0  0  0   0   0   0   0   1   0
13  0    1  -1  0   0  0  0  0  0  0  0  0   0  0  0  -1   0   0   0   0   1
14  0    1  -1  0   0  0  0  0  0  0  0  0   0  0  0   0  -1   0   0   0   0
15  1    0  -1  0   0  0  0  0  0  0  0  0  -1  0  0   0   0   0   0   0   0
16 90 -100 100  0 -80  0  0  0  0  0  0  0 220  0  0 200 160   0 180   0   0

=====> Iteration #5

   S1 S2 S3 S4  S5 S6 S7 S8 x1 x2 x3 x4  x5 x6 x7  x8  x9 x10 x11 x12 x13 x14
1  -1  0  1  0   0  0  0  0  1  0  0  0   0  0  0   0   0   0  -1   0   0   0
2  -1  0  0  0   1  0  0  0  0  1  0  0   0  0  0   0   0   0   0   0   0   0
3  -1  0  1  0   0  0  0  0  0  0  1  0   0  0  0   0   0   0   0   0  -1   0
4  -1  0  1  0   0  0  0  0  0  0  0  1   0  0  0   1  -1   0   0   0  -1   0
5  -1  0  0  0   0  0  0  0  1  0  0  0   1  0  0   0   0   0   0   0   0   0
6   0  0  0  0   0  0  0  0  0  0  0  0   0  1  0  -1   0   0  -1   0   1   0
7   0  0 -1  0   1  0  0  0  0  0  0  0   0  0  1  -1   0   0   0   0   1   0
8   0  0 -1  0   0  1  0  0  0  0  0  0   0  0  0   0   0   0   0   0   1   0
9   0  0 -1  0   0  0  1  0  0  0  0  0   0  0  0  -1   1   0   0   0   1   0
10  1  0 -1  0   0  0  0  0  0  0  0  0  -1  0  0  -1   0   1   0   0   1   0
11  0  0 -1  1   0  0  0  0  0  0  0  0   0  0  0   0   0   0   1   0   0   0
12  0  0 -1  0   1  0  0  0  0  0  0  0   0  0  0   0   0   0   0   1   0   0
13  0  1 -1  0   0  0  0  0  0  0  0  0   0  0  0  -1   0   0   0   0   1   0
14  0  0  0  0   0  0  0  0  0  0  0  0   0  0  0   1  -1   0   0   0  -1   1
15  1  0 -1  0   0  0  0  0  0  0  0  0  -1  0  0   0   0   0   0   0   0   0
16 90  0  0  0 -80  0  0  0  0  0  0  0 220  0  0 100 160   0 180   0 100   0
```

```
=====> Iteration #6

   S1 S2  S3 S4 S5 S6 S7 S8 x1 x2 x3 x4  x5 x6 x7  x8  x9 x10 x11 x12 x13 x14
1  -1  0   1  0  0  0  0  0  1  0  0  0   0  0  0   0   0   0  -1   0   0   0
2  -1  0   1  0  0  0  0  0  0  1  0  0   0  0  0   0   0   0   0  -1   0   0
3  -1  0   1  0  0  0  0  0  0  0  1  0   0  0  0   0   0   0   0   0  -1   0
4  -1  0   1  0  0  0  0  0  0  0  0  1   0  0  0   1  -1   0   0   0  -1   0
5  -1  0   0  0  0  0  0  1  0  0  0  0   1  0  0   0   0   0   0   0   0   0
6   0  0   0  0  0  0  0  0  0  0  0  0   0  1  0  -1   0   0  -1   0   1   0
7   0  0   0  0  0  0  0  0  0  0  0  0   0  0  1  -1   0   0   0  -1   1   0
8   0  0  -1  0  0  1  0  0  0  0  0  0   0  0  0   0   0   0   0   0   1   0
9   0  0  -1  0  0  0  1  0  0  0  0  0   0  0  0  -1   1   0   0   0   1   0
10  1  0  -1  0  0  0  0  0  0  0  0  0  -1  0  0  -1   0   1   0   0   1   0
11  0  0  -1  1  0  0  0  0  0  0  0  0   0  0  0   0   0   0   1   0   0   0
12  0  0  -1  0  1  0  0  0  0  0  0  0   0  0  0   0   0   0   0   1   0   0
13  0  1  -1  0  0  0  0  0  0  0  0  0   0  0  0  -1   0   0   0   0   1   0
14  0  0   0  0  0  0  0  0  0  0  0  0   0  0  0   1  -1   0   0   0  -1   1
15  1  0  -1  0  0  0  0  0  0  0  0  0  -1  0  0   0   0   0   0   0   0   0
16 90  0 -80  0  0  0  0  0  0  0  0 220  0  0 100 160   0 180  80 100   0

=====> Iteration #7

   S1 S2 S3 S4 S5 S6 S7 S8 x1 x2 x3 x4  x5 x6 x7  x8  x9 x10 x11 x12 x13 x14 x
1   0  0  0  0  0  0  0  0  1  0 -1  0   0  0  0   0   0   0  -1   0   1   0
2   0  0  0  0  0  0  0  0  0  1 -1  0   0  0  0   0   0   0   0  -1   1   0
3  -1  0  1  0  0  0  0  0  0  0  0  1   0  0  0   0   0   0   0   0  -1   0
4   0  0  0  0  0  0  0  0  0  0  0 -1   1  0  0   0   1  -1   0   0   0   0
5  -1  0  0  0  0  0  0  1  0  0  0  0   1  0  0   0   0   0   0   0   0   0
6   0  0  0  0  0  0  0  0  0  0  0  0   0  1  0  -1   0   0  -1   0   1   0
7   0  0  0  0  0  0  0  0  0  0  0  0   0  0  1  -1   0   0   0  -1   1   0
8  -1  0  0  0  0  1  0  0  0  0  1  0   0  0  0   0   0   0   0   0   0   0
9  -1  0  0  0  0  0  1  0  0  0  1  0   0  0  0  -1   1   0   0   0   0   0
10  0  0  0  0  0  0  0  0  0  0  0  1   0 -1  0  -1   0   1   0   0   0   0
11 -1  0  0  1  0  0  0  0  0  0  1  0   0  0  0   0   0   0   1   0  -1   0
12 -1  0  0  0  1  0  0  0  0  0  1  0   0  0  0   0   0   0   0   1  -1   0
13 -1  1  0  0  0  0  0  0  0  0  1  0   0  0  0  -1   0   0   0   0   0   0
14  0  0  0  0  0  0  0  0  0  0  0  0   0  0  0   1  -1   0   0   0  -1   1
15  0  0  0  0  0  0  0  0  0  0  1  0  -1  0  0   0   0   0   0   0  -1   0
16 10  0  0  0  0  0  0  0  0  0 80  0 220  0  0 100 160   0 180  80  20   0
```

```
=====> Final Tableau

   S1 S2 S3 S4 S5 S6 S7 S8 x1 x2 x3 x4  x5 x6 x7  x8  x9 x10 x11 x12 x13 x14 x
1   0  0  0  0  0  0  0  0  1  0 -1  0   0  0  0   0   0   0  -1   0   1   0
2   0  0  0  0  0  0  0  0  0  1 -1  0   0  0  0   0   0   0   0  -1   1   0
3  -1  0  1  0  0  0  0  0  0  0  1  0   0  0  0   0   0   0   0   0  -1   0
4   0  0  0  0  0  0  0  0  0  0 -1  1   0  0  0   1  -1   0   0   0   0   0
5  -1  0  0  0  0  0  0  1  0  0  0  0   1  0  0   0   0   0   0   0   0   0
6   0  0  0  0  0  0  0  0  0  0  0  0   0  1  0  -1   0   0  -1   0   1   0
7   0  0  0  0  0  0  0  0  0  0  0  0   0  0  1  -1   0   0   0  -1   1   0
8  -1  0  0  0  0  1  0  0  0  0  1  0   0  0  0   0   0   0   0   0   0   0
9  -1  0  0  0  0  0  1  0  0  0  1  0   0  0  0  -1   1   0   0   0   0   0
10  0  0  0  0  0  0  0  0  0  0  0  1   0 -1  0  -1   0   1   0   0   0   0
11 -1  0  0  1  0  0  0  0  0  0  1  0   0  0  0   0   0   0   1   0  -1   0
12 -1  0  0  0  1  0  0  0  0  0  1  0   0  0  0   0   0   0   0   1  -1   0
13 -1  1  0  0  0  0  0  0  0  0  1  0   0  0  0  -1   0   0   0   0   0   0
14  0  0  0  0  0  0  0  0  0  0  0  0   0  0  0   1  -1   0   0   0  -1   1
15  0  0  0  0  0  0  0  0  0  0  1  0  -1  0  0   0   0   0   0   0  -1   0
16 10  0  0  0  0  0  0  0  0  0 80  0 220  0  0 100 160   0 180  80  20   0

=====> Basic Solution

  S1   S2   S3   S4   S5   S6   S7   S8   x1   x2   x3   x4   x5   x6   x7   x
  10    0    0    0    0    0    0    0    0    0   80    0  220    0    0  10

=====> Optimum

3200
```

Test Case 2

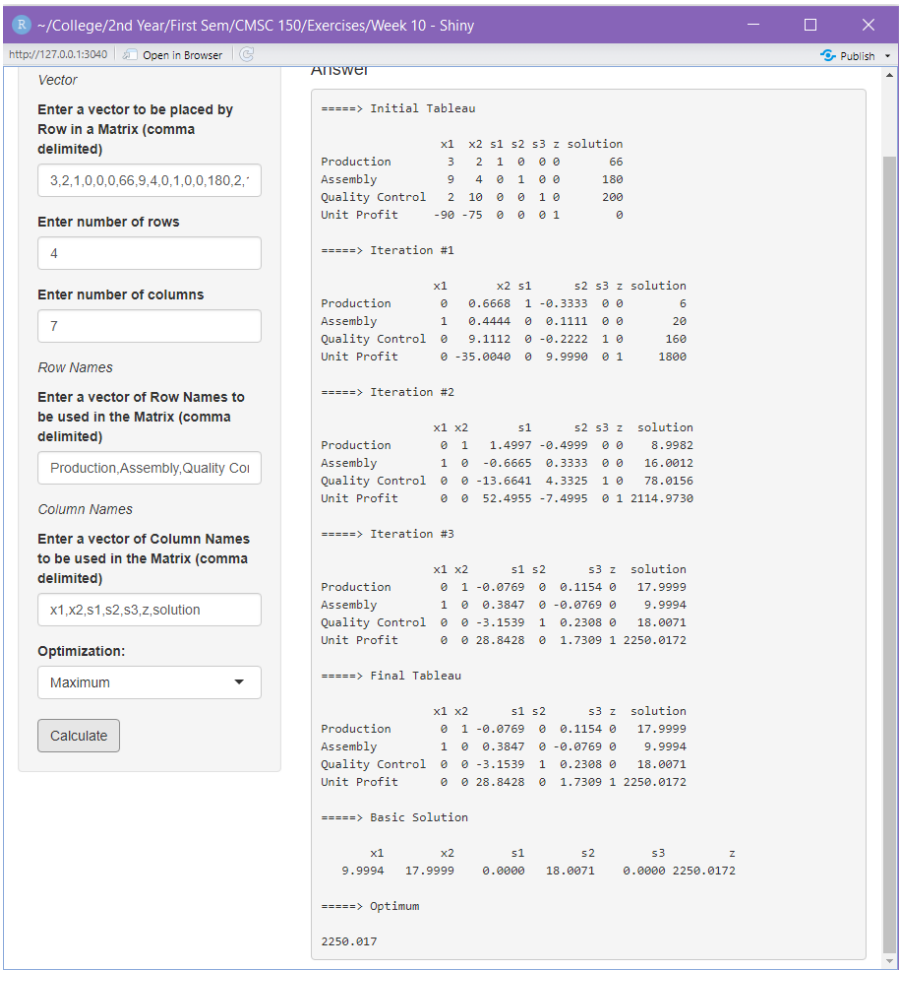



```
=====> Initial Tableau

   S1 S2 S3  S4  S5  S6  S7  S8 x1 x2 x3 x4 x5 x6 x7 x8 x9 x10 x11 x12 x13 x14
1  -1  0  0   1   0   0   0   0  1  0  0  0  0  0  0  0  0   0   0   0   0   0
2  -1  0  0   0   1   0   0   0  0  1  0  0  0  0  0  0  0   0   0   0   0   0
3  -1  0  0   0   0   1   0   0  0  0  1  0  0  0  0  0  0   0   0   0   0   0
4  -1  0  0   0   0   0   1   0  0  0  0  1  0  0  0  0  0   0   0   0   0   0
5  -1  0  0   0   0   0   0   1  0  0  0  0  1  0  0  0  0   0   0   0   0   0
6   0 -1  0   1   0   0   0   0  0  0  0  0  0  1  0  0  0   0   0   0   0   0
7   0 -1  0   0   1   0   0   0  0  0  0  0  0  0  1  0  0   0   0   0   0   0
8   0 -1  0   0   0   1   0   0  0  0  0  0  0  0  0  1  0   0   0   0   0   0
9   0 -1  0   0   0   0   1   0  0  0  0  0  0  0  0  0  1   0   0   0   0   0
10  0 -1  0   0   0   0   0   1  0  0  0  0  0  0  0  0  0   1   0   0   0   0
11  0  0 -1   1   0   0   0   0  0  0  0  0  0  0  0  0  0   0   1   0   0   0
12  0  0 -1   0   1   0   0   0  0  0  0  0  0  0  0  0  0   0   0   1   0   0
13  0  0 -1   0   0   1   0   0  0  0  0  0  0  0  0  0  0   0   0   0   1   0
14  0  0 -1   0   0   0   1   0  0  0  0  0  0  0  0  0  0   0   0   0   0   1
15  0  0 -1   0   0   0   0   1  0  0  0  0  0  0  0  0  0   0   0   0   0   0
16 50 50 50 -20 -25 -90 -60 -70  0  0  0  0  0  0  0  0  0   0   0   0   0   0

=====> Iteration #1

   S1 S2  S3  S4  S5 S6  S7  S8 x1 x2 x3 x4 x5 x6 x7 x8 x9 x10 x11 x12 x13 x14
1  -1  0   0   1   0  0   0   0  1  0  0  0  0  0  0  0  0   0   0   0   0   0
2  -1  0   0   0   1  0   0   0  0  1  0  0  0  0  0  0  0   0   0   0   0   0
3  -1  0   1   0   0  0   0   0  0  0  1  0  0  0  0  0  0   0   0   0  -1   0
4  -1  0   0   0   0  0   1   0  0  0  0  1  0  0  0  0  0   0   0   0   0   0
5  -1  0   0   0   0  0   0   1  0  0  0  0  1  0  0  0  0   0   0   0   0   0
6   0 -1   0   1   0  0   0   0  0  0  0  0  0  1  0  0  0   0   0   0   0   0
7   0 -1   0   0   1  0   0   0  0  0  0  0  0  0  1  0  0   0   0   0   0   0
8   0 -1   1   0   0  0   0   0  0  0  0  0  0  0  0  1  0   0   0   0  -1   0
9   0 -1   0   0   0  0   1   0  0  0  0  0  0  0  0  0  1   0   0   0   0   0
10  0 -1   0   0   0  0   0   1  0  0  0  0  0  0  0  0  0   1   0   0   0   0
11  0  0  -1   1   0  0   0   0  0  0  0  0  0  0  0  0  0   0   1   0   0   0
12  0  0  -1   0   1  0   0   0  0  0  0  0  0  0  0  0  0   0   0   1   0   0
13  0  0  -1   0   0  1   0   0  0  0  0  0  0  0  0  0  0   0   0   0   1   0
14  0  0  -1   0   0  0   1   0  0  0  0  0  0  0  0  0  0   0   0   0   0   1
15  0  0  -1   0   0  0   0   1  0  0  0  0  0  0  0  0  0   0   0   0   0   0
16 50 50 -40 -20 -25  0 -60 -70  0  0  0  0  0  0  0  0  0   0   0   0  90   0
```

```
=====> Iteration #2

   S1 S2   S3  S4  S5 S6  S7 S8 x1 x2 x3 x4 x5 x6 x7 x8 x9 x10 x11 x12 x13 x14
1  -1  0    0   1   0  0   0  0  1  0  0  0  0  0  0  0  0   0   0   0   0   0
2  -1  0    0   0   1  0   0  0  0  1  0  0  0  0  0  0  0   0   0   0   0   0
3  -1  0    1   0   0  0   0  0  0  0  1  0  0  0  0  0  0   0   0   0  -1   0
4  -1  0    0   0   0  0   1  0  0  0  0  1  0  0  0  0  0   0   0   0   0   0
5  -1  0    1   0   0  0   0  0  0  0  0  0  1  0  0  0  0   0   0   0   0   0
6   0 -1    0   1   0  0   0  0  0  0  0  0  0  1  0  0  0   0   0   0   0   0
7   0 -1    0   0   1  0   0  0  0  0  0  0  0  0  1  0  0   0   0   0   0   0
8   0 -1    1   0   0  0   0  0  0  0  0  0  0  0  0  1  0   0   0   0  -1   0
9   0 -1    0   0   0  0   1  0  0  0  0  0  0  0  0  0  1   0   0   0   0   0
10  0 -1    1   0   0  0   0  0  0  0  0  0  0  0  0  0  0   1   0   0   0   0
11  0  0   -1   1   0  0   0  0  0  0  0  0  0  0  0  0  0   0   1   0   0   0
12  0  0   -1   0   1  0   0  0  0  0  0  0  0  0  0  0  0   0   0   1   0   0
13  0  0   -1   0   0  1   0  0  0  0  0  0  0  0  0  0  0   0   0   0   1   0
14  0  0   -1   0   0  0   1  0  0  0  0  0  0  0  0  0  0   0   0   0   0   1
15  0  0   -1   0   0  0   0  1  0  0  0  0  0  0  0  0  0   0   0   0   0   0
16 50 50 -110 -20 -25  0 -60  0  0  0  0  0  0  0  0  0  0   0   0   0  90   0

=====> Iteration #3

   S1  S2 S3  S4  S5 S6  S7 S8 x1 x2 x3 x4 x5 x6 x7  x8 x9 x10 x11 x12 x13 x14
1  -1   0  0   1   0  0   0  0  1  0  0  0  0  0  0   0  0   0   0   0   0   0
2  -1   0  0   0   1  0   0  0  0  1  0  0  0  0  0   0  0   0   0   0   0   0
3  -1   1  0   0   0  0   0  0  0  0  1  0  0  0  0  -1  0   0   0   0   0   0
4  -1   0  0   0   0  0   1  0  0  0  0  1  0  0  0   0  0   0   0   0   0   0
5  -1   1  0   0   0  0   0  0  0  0  0  0  1  0  0  -1  0   0   0   0   1   0
6   0  -1  0   1   0  0   0  0  0  0  0  0  0  1  0   0  0   0   0   0   0   0
7   0  -1  0   0   1  0   0  0  0  0  0  0  0  0  1   0  0   0   0   0   0   0
8   0  -1  1   0   0  0   0  0  0  0  0  0  0  0  0   1  0   0   0   0  -1   0
9   0  -1  0   0   0  0   1  0  0  0  0  0  0  0  0   0  1   0   0   0   0   0
10  0   0  0   0   0  0   0  0  0  0  0  0  0  0  0  -1  0   1   0   0   1   0
11  0  -1  0   1   0  0   0  0  0  0  0  0  0  0  0   1  0   0   1   0  -1   0
12  0  -1  0   0   1  0   0  0  0  0  0  0  0  0  0   1  0   0   0   1  -1   0
13  0  -1  0   0   0  1   0  0  0  0  0  0  0  0  0   1  0   0   0   0   0   0
14  0  -1  0   0   0  0   1  0  0  0  0  0  0  0  0   1  0   0   0   0  -1   1
15  0  -1  0   0   0  0   0  1  0  0  0  0  0  0  0   1  0   0   0   0  -1   0
16 50 -60  0 -20 -25  0 -60  0  0  0  0  0  0  0  0 110  0   0   0   0 -20   0
```

```
=====> Iteration #4

    S1 S2 S3  S4  S5 S6  S7 S8 x1 x2 x3 x4 x5 x6 x7 x8 x9 x10 x11 x12 x13 x14
1   -1  0  0   1   0  0   0  0  1  0  0  0  0  0  0  0  0   0   0   0   0   0
2   -1  0  0   0   1  0   0  0  0  1  0  0  0  0  0  0  0   0   0   0   0   0
3   -1  1  0   0   0  0   0  0  0  0  1  0  0  0  0 -1  0   0   0   0   0   0
4   -1  0  0   0   0  0   1  0  0  0  0  1  0  0  0  0  0   0   0   0   0   0
5    0  0  0   0   0  0   0  0  0  0 -1  0  1  0  0  0  0   0   0   0   1   0
6   -1  0  0   1   0  0   0  0  0  0  0  1  0  0  1 -1  0   0   0   0   0   0
7   -1  0  0   0   1  0   0  0  0  0  0  0  1  0  0  1 -1   0   0   0   0   0
8   -1  0  1   0   0  0   0  0  0  0  0  0  1  0  0  0  0   0   0   0  -1   0
9   -1  0  0   0   0  0   1  0  0  0  0  0  0  1  0  0 -1   1   0   0   0   0
10   0  0  0   0   0  0   0  0  0  0  0  0  0  0  1  0 -1   0   1   0   0   0
11  -1  0  0   1   0  0   0  0  0  0  0  0  0  0  0  1  0   0   0   1   0  -1
12  -1  0  0   0   1  0   0  0  0  0  0  0  0  0  0  0  1   0   0   0   1  -1
13  -1  0  0   0   0  1   0  0  0  0  0  0  0  0  0  0  0   1   0   0   0   0
14  -1  0  0   0   0  0   1  0  0  0  0  0  0  0  0  0  0   0   1   0   0  -1
15  -1  0  0   0   0  0   0  1  0  0  1  0  0  0  0  0  0   0   0   0   0   0
16 -10  0  0 -20 -25  0 -60  0  0  0 60  0  0  0  0 50  0   0   0   0 -20   0

=====> Iteration #5

    S1 S2 S3  S4  S5 S6 S7 S8 x1 x2  x3 x4 x5 x6 x7  x8 x9 x10 x11 x12 x13 x14
1   -1  0  0   1   0  0  0  0  1  0   0  0  0  0  0   0  0   0   0   0   0   0
2   -1  0  0   0   1  0  0  0  0  1   0  0  0  0  0   0  0   0   0   0   0   0
3   -1  1  0   0   0  0  0  0  0  0   1  0  0  0  0  -1  0   0   0   0   0   0
4    0  0  0   0   0  0  0  0  0  0  -1  1  0  0  0   1 -1   0   0   0   0   0
5    0  0  0   0   0  0  0  0  0  0  -1  0  1  0  0   0  0   0   0   0   1   0
6   -1  0  0   1   0  0  0  0  0  0   1  0  0  1  0  -1  0   0   0   0   0   0
7   -1  0  0   0   1  0  0  0  0  0   1  0  0  0  1  -1  0   0   0   0   0   0
8   -1  0  1   0   0  0  0  0  0  0   1  0  0  0  0   0  0   0   0   0  -1   0
9   -1  0  0   0   0  0  1  0  0  0   1  0  0  0  0  -1  1   0   0   0   0   0
10   0  0  0   0   0  0  0  0  0  0   0  0  0  0  0  -1  0   1   0   0   1   0
11  -1  0  0   1   0  0  0  0  0  0   1  0  0  0  0   0  0   0   1   0  -1   0
12  -1  0  0   0   1  0  0  0  0  0   1  0  0  0  0   0  0   0   0   1  -1   0
13  -1  0  0   0   0  1  0  0  0  0   1  0  0  0  0   0  0   0   0   0   0   0
14   0  0  0   0   0  0  0  0  0  0   0  0  0  0  0   1 -1   0   0   0  -1   1
15  -1  0  0   0   0  0  0  1  0  0   1  0  0  0  0   0  0   0   0   0  -1   0
16 -70  0  0 -20 -25  0  0  0  0  0 120  0  0  0  0 -10 60   0   0   0 -20   0


Iteration stops here,
No Feasible Solution!
```

Test Case 3



Warnings the user may encounter:

Simplex Method follows some rules regarding the data that needs to be calculated. The message that can be seen on the main panel is the error in the input that the user needs to fix.