

USER' S GUIDE FOR

QUADRATIC SPLINE INTERPOLATION AND SIMPLEX METHOD APPLICATION

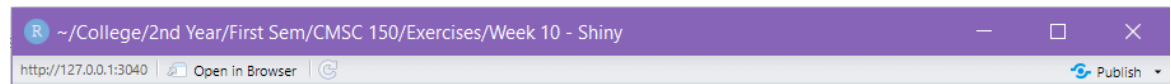
John Byron C. Garin

2021-02658

CMSC 150-X1L

December 2, 2022

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.

CALCULATE BUTTON

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

X VALUE

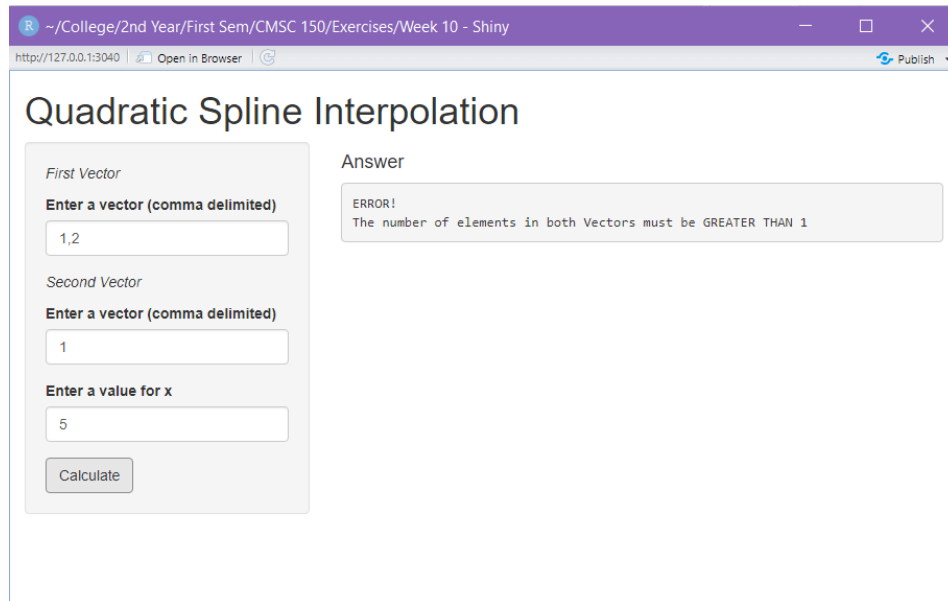
Input the x value here that will be used to approximate the value of $f_n(x)$

SECOND VECTOR

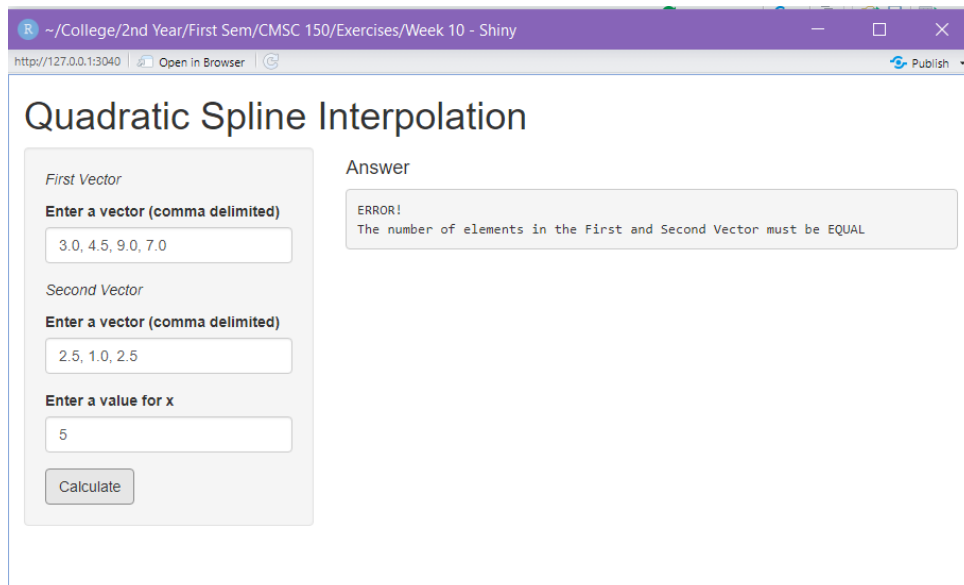
Input the numeric values here that will serve as the SECOND VECTOR. Your input must be comma delimited so that the program will be able to distinguish the numerical values from each other.

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.



The screenshot shows a web browser window with the title "Quadratic Spline Interpolation". The URL bar shows "http://127.0.0.1:3040". The page has a purple header bar with the R logo and the text "R ~ /College/2nd Year/First Sem/CMSC 150/Exercises/Week 10 - Shiny". Below the header, there is a "Publish" button. The main content area is titled "Quadratic Spline Interpolation". It contains three input fields: "First Vector" with the value "1,2", "Second Vector" with the value "1", and "Enter a value for x" with the value "5". There is a "Calculate" button. To the right of the input fields, there is an "Answer" section with an error message: "ERROR! The number of elements in both Vectors must be GREATER THAN 1".



The screenshot shows the same web browser window with the title "Quadratic Spline Interpolation". The URL bar shows "http://127.0.0.1:3040". The page has a purple header bar with the R logo and the text "R ~ /College/2nd Year/First Sem/CMSC 150/Exercises/Week 10 - Shiny". Below the header, there is a "Publish" button. The main content area is titled "Quadratic Spline Interpolation". It contains three input fields: "First Vector" with the value "3.0, 4.5, 9.0, 7.0", "Second Vector" with the value "2.5, 1.0, 2.5", and "Enter a value for x" with the value "5". There is a "Calculate" button. To the right of the input fields, there is an "Answer" section with an error message: "ERROR! The number of elements in the First and Second Vector must be EQUAL".

~/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)

Second Vector

Enter a vector (comma delimited)

Enter a value for x

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)

Second Vector

Enter a vector (comma delimited)

Enter a value for x

Calculate

Answer

ERROR!
x Value must be inside the range of values of the First vector

SIMPLEX METHOD

The diagram illustrates a web application titled "Simplex Method" with the following components and callouts:

- 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.

The application interface includes the following fields and controls:

- Vector**: Enter a vector to be placed by Row in a Matrix (comma delimited)
- Enter number of rows**
- Enter number of columns**
- Row Names**: Enter a vector of Row Names to be used in the Matrix (comma delimited)
- Column Names**: Enter a vector of Column Names to be used in the Matrix (comma delimited)
- Optimization:** Maximum (dropdown menu)
- Calculate** button

The application also displays an **Answer** section for the results.

(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

Re College/2nd Year/First Sem/CMSC 150/Exercises/Week 10 - Shiny

http://127.0.0.1:3040 Open in Browser

Simplex Method

Vector

Enter a vector to be placed by Row in a Matrix (comma delimited)

-1,0,0,1,0,0,0,0,1,0,0,0,0,0,0,0,0

Enter number of rows

16

Enter number of columns

25

Row Names

Enter a vector of Row Names to be used in the Matrix (comma delimited)

1,2,3,4,5,6,7,8,9,10,11,12,13,14,

Column Names

Enter a vector of Column Names to be used in the Matrix (comma delimited)

S1,S2,S3,S4,S5,S6,S7,S8,x1,x2

Optimization:

Minimum

Calculate

Answer

====> Initial Tableau

	S1	S2	S3	S4	S5	S6	S7	S8	x1	x2	x3	x4	x5	x6	x7	x8	x9	x10	x11	x12
1	-1	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
2	-1	0	0	0	1	0	0	0	0	0	1	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
4	-1	0	0	0	0	0	1	0	0	0	0	1	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
6	0	-1	0	1	0	0	0	0	0	0	0	0	0	1	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
8	0	-1	0	0	0	1	0	0	0	0	0	0	0	0	0	1	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
10	0	-1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0
11	0	0	-1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
12	0	0	-1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
13	0	0	-1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	-1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	-1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
16	310	260	280	-180	-80	-200	-160	-220	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
1	-1	0	0	1	0	0	0	0	1	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
3	-1	0	0	0	0	1	0	0	0	0	1	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
5	-1	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0			

```
====> 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	0	1	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	1	0	0	0	0	0	0	0	0
7	0	-1	0	0	1	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
9	0	-1	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	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	x3	0	x6	0	0	x8	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	60	280	-180	-80	0	-160	0	0	0	0	0	220	0	0	200	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	x14
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
1	-1	0	1	0	0	0	0	0	1	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	
3	-1	1	0	0	0	0	0	0	0	1	0	0	0	0	0	-1	0	0	0	0	
4	-1	1	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	
6	0	-1	1	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	
8	0	-1	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	
9	0	-1	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	
11	0	-1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	
12	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	1	
14	0	1	-1	0	0	0	0	0	0	0	0	0	0	0	0	0	-1	0	0	0	
15	1	0	-1	0	0	0	0	0	0	0	0	0	-1	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	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	-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	-1	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 #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 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 0 0 0 0 0 0 0 0 0 0 0
3 -1 0 1 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
4 -1 0 0 0 0 0 0 1 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
5 -1 0 1 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
6 0 -1 0 1 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
7 0 -1 0 0 1 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
8 0 -1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
9 0 -1 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0
10 0 -1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0
11 0 0 -1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0
12 0 0 -1 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0
13 0 0 -1 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0
14 0 0 -1 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0
15 0 0 -1 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 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 0 0 0 90 0 0 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 x14
1 -1 0 0 1 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 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 0 0 0 0 0 0 0 0 0 0 0
3 -1 1 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
4 -1 0 0 0 0 1 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
5 -1 1 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
6 0 -1 0 1 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
7 0 -1 0 0 1 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
8 0 -1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
9 0 -1 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0
10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0
11 0 -1 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0
12 0 -1 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
13 0 -1 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0
14 0 -1 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0
15 0 -1 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0
16 50 -60 0 -20 -25 0 -60 0 0 0 0 0 0 0 0 0 0 0 0 110 0 0 0 0 -20 0 0 0 0 0 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 x14
1 -1 0 0 1 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 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 0 0 0 0 0 0 0 0 0 0 0
3 -1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
4 -1 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
5 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
6 -1 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0
7 -1 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
8 -1 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
9 -1 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0
10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
11 -1 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
12 -1 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0
13 -1 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0
14 -1 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
15 -1 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
16 -10 0 0 -20 -25 0 -60 0 0 0 0 0 0 0 0 0 0 0 0 50 0 0 0 0 -20 0 0 0 0 0 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 0 1 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 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 0 0 0 0 0 0 0 0 0 0 0
3 -1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
4 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0
5 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0
6 -1 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0
7 -1 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0
8 -1 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0
9 -1 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0
10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
11 -1 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0
12 -1 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0
13 -1 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 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 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
15 -1 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
16 -70 0 0 -20 -25 0 0 0 0 0 0 0 0 0 0 0 0 0 0 120 0 0 0 0 -10 60 0 0 0 0 -20 0 0

Iteration stops here,
No Feasible Solution!

```

Test Case 3

~/College/2nd Year/First Sem/CMSC 150/Exercises/Week 10 - Shiny

http://127.0.0.1:3040 | Open in Browser | Publish

Vector

Enter a vector to be placed by Row in a Matrix (comma delimited)

3,2,1,0,0,0,66,9,4,0,1,0,0,180,2,'

Enter number of rows

4

Enter number of columns

7

Row Names

Enter a vector of Row Names to be used in the Matrix (comma delimited)

Production,Assembly,Quality Control

Column Names

Enter a vector of Column Names to be used in the Matrix (comma delimited)

x1,x2,s1,s2,s3,z,solution

Optimization:

Maximum

Calculate

ANSWER

====> Initial Tableau

	x1	x2	s1	s2	s3	z	solution
Production	3	2	1	0	0	0	66
Assembly	9	4	0	1	0	0	180
Quality Control	2	10	0	0	1	0	200
Unit Profit	-90	-75	0	0	0	1	0

====> Iteration #1

	x1	x2	s1	s2	s3	z	solution
Production	0	0.6668	1	-0.3333	0	0	6
Assembly	1	0.4444	0	0.1111	0	0	20
Quality Control	0	9.1112	0	-0.2222	1	0	160
Unit Profit	0	-35.0040	0	9.9990	0	1	1800

====> Iteration #2

	x1	x2	s1	s2	s3	z	solution
Production	0	1	1.4997	-0.4999	0	0	8.9982
Assembly	1	0	-0.6665	0.3333	0	0	16.0012
Quality Control	0	0	-13.6641	4.3325	1	0	78.0156
Unit Profit	0	0	52.4955	-7.4995	0	1	2114.9730

====> Iteration #3

	x1	x2	s1	s2	s3	z	solution
Production	0	1	-0.0769	0	0.1154	0	17.9999
Assembly	1	0	0.3847	0	-0.0769	0	9.9994
Quality Control	0	0	-3.1539	1	0.2308	0	18.0071
Unit Profit	0	0	28.8428	0	1.7309	1	2250.0172

====> Final Tableau

	x1	x2	s1	s2	s3	z	solution
Production	0	1	-0.0769	0	0.1154	0	17.9999
Assembly	1	0	0.3847	0	-0.0769	0	9.9994
Quality Control	0	0	-3.1539	1	0.2308	0	18.0071
Unit Profit	0	0	28.8428	0	1.7309	1	2250.0172

====> Basic Solution

	x1	x2	s1	s2	s3	z
	9.9994	17.9999	0.0000	18.0071	0.0000	2250.0172

====> Optimum

2250.017

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.

The screenshot shows the Simplex Method application interface. The title bar indicates the file path: `~/College/2nd Year/First Sem/CMSC 150/Exercises/Week 10 - Shiny`. The browser address bar shows `http://127.0.0.1:3040`. The main heading is "Simplex Method".

Vector

Enter a vector to be placed by Row in a Matrix (comma delimited)

3,2,1,0,0,0,66,9,4,0,1,0,0,180,2,1

Enter number of rows

5

Enter number of columns

7

Row Names

Enter a vector of Row Names to be used in the Matrix (comma delimited)

Production,Assembly,Quality Con

Column Names

Enter a vector of Column Names to be used in the Matrix (comma delimited)

x1,x2,s1,s2,s3,z,solution

Optimization:

Maximum

Calculate

Answer

ERROR!
Number of Row Names/Col Names is not equal to the number of Row/Column

The screenshot shows the Simplex Method application interface with a detailed error message. The title bar and browser address bar are the same as in the previous screenshot.

Simplex Method

Vector

Enter a vector to be placed by Row in a Matrix (comma delimited)

2,1,0,0,0,66,9,4,0,1,0,0,180,2,10,

Enter number of rows

4

Enter number of columns

7

Row Names

Enter a vector of Row Names to be used in the Matrix (comma delimited)

Production,Assembly,Quality Con

Column Names

Enter a vector of Column Names to be used in the Matrix (comma delimited)

x1,x2,s1,s2,s3,z,solution

Optimization:

Maximum

Calculate

Answer

ERROR!
Number of input does not align with the number of rows and columns.

Some elements may repeat/cut.

Number of elements in the matrix must be equal to the product of the number of rows and columns.