

## ADDITIONAL INFO

### HOW TO INSTALL GWIDGETS2?

Open Installation.R to your R studio and run the script. It will automatically install gwidgets2 along with its dependencies..

### HOW TO RUN THE PROGRAM?

Open Main.R in R Studio and run the script. Make sure that the working directory is where the R files R.

### WHAT IS THE CSV FORMAT?

The values in the CSV must be comma separated for uniformity.

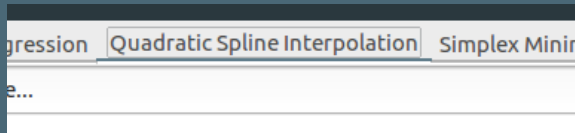
# Quadratic Spline Interpolation

**Ciara Mae Gotis**  
**B-3L**

# HOW TO USE

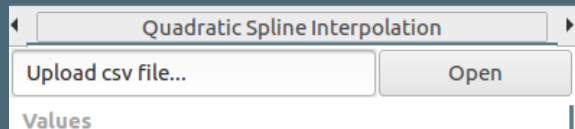
## Step 1:

Once you run the app, you will see three main tab in the upper left. Click the Quadratic Spline Interpolation.



## Step 2:

Once you're in the QSI tab. Click on the button labeled Open and select the file that you want to upload. Note that only CSV files are accepted.



## Step 3:

Now that you have uploaded the file, you will notice that a table has been updated containing the values from the csv file. You can now also view the functions per interval.

The x and y value table will appear after file selection

X1	X2
0	2.1
1	7.7
2	13.6
3	27.2

The functions per interval will also be displayed

```
value
evaluateFunction <- function(x) return( 0*x^2 + 5.6 *x + 2.1 )
evaluateFunction <- function(x) return( 0.2999999999999999 *x^2 + 5 *x + 2.4 )
evaluateFunction <- function(x) return( 7.399999999999999 *x^2 + -23.4 *x + 30.8 )
evaluateFunction <- function(x) return( -7.299999999999998 *x^2 + 64.79999999999999 )
evaluateFunction <- function(x) return( 13.8 *x^2 + -104 *x + 236.1 )
```

## Step 4:

Next, enter an input in the text box in order for the program to choose the appropriate function for the input. After typing the input, press ENTER.

Enter number

Values

## Step 5:

After pressing ENTER, you'll notice the selected function for your input and the output of the function upon using the input is now showed on the window.

Appropriate Function for Input:
evaluateFunction <- function(x) return( 13.8 *x^2 + -104 *x + 236.1 )
Output
47.55

And there you have it!

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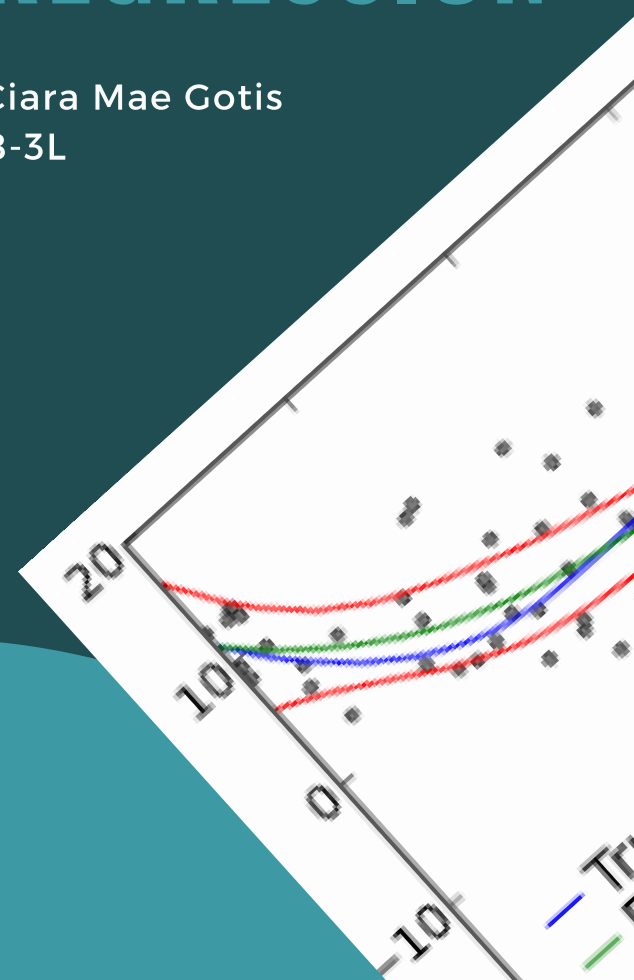
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# POLYNOMIAL REGRESSION

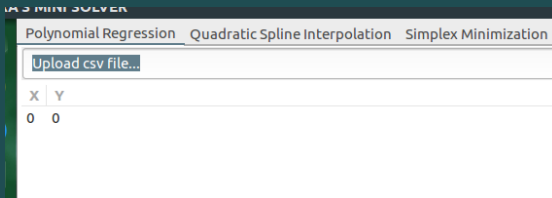
Ciara Mae Gotis  
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# HOW TO USE

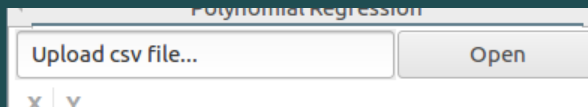
## STEP 1

Open the application. You will see three main tabs on the upper left. Click on the Polynomial Regression tab.



## STEP 2

Next, click the Open button in order to select the csv file that you want to upload.



## STEP 3

Once that you have uploaded the file, you will notice that the table is updated based on the input's x and y values. Next step is to type the degree of the function that will be produced. After typing the degree, press ENTER.

Updated x and y values

X	Y
0	2.1
1	7.7
2	13.6
3	27.2
4	40.9
5	61.1

Enter n where n is the degree of the resulting polynomial. Press ENTER.

Enter degree	
X	Predicted.Y
0	0

It shows the resulting nth degree polynomial and the predicted Y values from the given X values

4	
plotValues <- function(x) -0.020833333333331815*x^4 + 0.2842	
X	Predicted.Y
0	2.215079
1	7.124603
2	14.75079
3	26.04921
4	41.4754
5	60.98492

# HOW TO USE

## STEP 4

You can also try getting the resulting y value of a number by trying to the lowest input box. After typing, press ENTER and you will see the resulting y value.

Type the number input here then press ENTER

Num to evaluate

The result will be shown directly below the input box.

4
42.9276190476189

And there you have it! You now have a mini polynomial regression solver!

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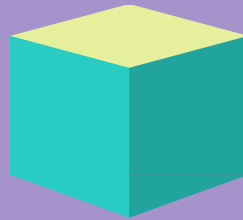
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# SIMPLEX MINIMIZATION

# HOW TO USE

**STEP 3: If you want to change the constraint, you can do so by typing on the input box in the table then PRESS enter.**

## STEP 2: Tick the checkbox if you want to see the BSS per iteration

## STEP 1: Select CSV File

## STEP 4: Press solve

Polynomial Regression
Quadratic Spline Interpolation
Simplex Minimization

☒ Show basis solution (initial and per iteration)

	Demands	180	80	200	160	220
Plants	Supply	California	Utah	New Mexico	Illinois	New York City
Denver	310	10	8	6	5	4
Phoenix	260	6	5	4	3	6
	280	3	4	5	5	9

Initial Tableau

X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11	X12	X13	X14	X15	S1	S2	S3	S4	S5	S6	S7	S8	Z	ANS
1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	310
0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	260

Equations

$$310 = 1 \cdot X1 + 1 \cdot X2 + 1 \cdot X3 + 1 \cdot X4 + 1 \cdot X5 + 1 \cdot S1$$

$$260 = 1 \cdot X6 + 1 \cdot X7 + 1 \cdot X8 + 1 \cdot X9 + 1 \cdot X10 + 1 \cdot S2$$

BSS per Iteration

X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11	X12	X13	X14	X15	S1	S2	S3	S4	S5	S6	S7	S8	Z
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	310	260	280	-180	-80	-200	-160	-220	0
180	0	0	0	0	0	0	0	0	0	0	0	0	0	0	130	260	280	0	-80	-200	-160	-220	-1800

Final Matrix

X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11	X12	X13	X14	X15	S1	S2	S3	S4	S5	S6	S7	S8	Z	ANS
0	1	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	-1	0	0	0	0	80
-1	-1	-1	0	0	0	0	0	1	1	0	0	0	1	1	0	1	1	1	1	1	0	0	0	80

Solution Set

X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11	X12	X13	X14	X15	S1	S2	S3	S4	S5	S6	S7	S8	Z
0	0	0	80	220	0	0	180	80	0	180	80	20	0	0	10	0	0	0	0	0	0	0	-3200