

CMSC 150 GENERIC SOLVER USER MANUAL

About

This user manual is to help you navigate through the Generic Solver for Polynomial Regression, Quadratic Spline Interpolation, and Simplexes.

How to Use This

Requirements:

- > Make sure that the .csv files are properly formatted (e.g. extra newline at the end of the file)
- > Make sure you have everything listed in the INSTALL.txt file

Running the App:

- > Navigate to the project folder and run RUNME.sh on your terminal using ./RUNME.sh

The resulting app window should look like this when it opens in your browser:

The screenshot shows a web application interface for a generic solver. At the top, there is a section titled "Choose CSV file" with a "Browse..." button and a status "No file selected". Below this, there are three tabs: "Polynomial Regression" (selected), "Quadratic Spline", and "Simplex". The "Polynomial Regression" tab is active, showing two input fields: "Input value for function degree:" with a placeholder "degree = ?" and "Input x value:" with a placeholder "x = ?". Below these fields are two buttons: "Display Equation" and "Estimate X". To the right of the input fields is a large area labeled "Results".

Select a .csv file using the “Browse” button before you begin. Afterwards, you can navigate the solvers by clicking on their respective tabs.

Polynomial Regression

Choose CSV file

Browse...

poly_reg_sample.csv

Upload complete

Polynomial Regression

Quadratic Spline

Simplex

Input value for function degree:

2

Input x value:

2

Display Equation

Estimate X

Results

Your function: function (x) 7.96048109965681 + -0.153711340206198 * x^1 + 0.00107560137457053 * x^2

function (x) 7.96048109965681 + -0.153711340206198 * x^1 + 0.00107560137457053 * x^2 when x = 2 : 7.6573608247427

Here you can solve for the nth order function that will model your given data and the estimate of $f(x)$.

1. Insert your desired function degree in its respective input box
2. Insert you desired value of x in its respective input box
3. Click the “Display Equation” button to see your equation
4. Click the “Estimate X” button to see the function value given your desired value of x
5. If you want to read data from a different .csv file, select it using the “Browse” button and start over at Step 1

Quadratic Spline

Choose CSV file

Browse...

quad_spline_sample1.csv

Upload complete

Polynomial Regression

Quadratic Spline

Simplex

Input x value:

5

Display Equation

Estimate X

Equations:

function (x) 0 * x^2 + -1 * x^1 + 5.5 * x^0
function (x) 0.6400000000000002 * x^2 + -6.760000000000002 * x^1 + 18.46 * x^0
function (x) -1.6 * x^2 + 24.6 * x^1 + -91.30000000000002 * x^0

Your estimated x value when x = 5 is:
0.6599999999999947

Here you can solve for the function per interval and the estimate of $f(x)$.

1. Insert you desired value of x in its respective input box
2. Click the “Display Equation” button to see the equations for each interval
3. Click the “Estimate X” button to see the value of the function given your desired value of x
4. If you want to read data from a different .csv file, select it using the “Browse” button and start over at Step 1

Simplex

Here you can choose which simplex to solve(?) out of four testcases.

Choose CSV file

Browse...

simplex_1.csv

Upload complete

Polynomial Regression

Quadratic Spline

Simplex

Initial Tableau

Iterate!

Show Final Answer

Iterations

Iterations: 0 (initial tableau)

1.

Pick a simplex.csv file
2.

Click “Initial Tableau” to see the simplex’s initial tableau.*

Choose CSV file

Browse...

simplex_1.csv

Upload complete

Polynomial Regression

Quadratic Spline

Simplex

Initial Tableau

Iterate!

Show Final Answer

V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11	V12	V13	V14	V15	V16	V17	V18	V19	V20	V21
5.00	0.00	0.00	-5.00	-0.00	-0.00	-0.00	-0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6.00	0.00	0.00	-0.00	-6.00	-0.00	-0.00	-0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7.00	0.00	0.00	-0.00	-0.00	-7.00	-0.00	-0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8.00	0.00	0.00	-0.00	-0.00	-0.00	-8.00	-0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9.00	0.00	0.00	-0.00	-0.00	-0.00	-0.00	-9.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	6.00	0.00	-6.00	-0.00	-0.00	-0.00	-0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	7.00	0.00	-0.00	-7.00	-0.00	-0.00	-0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	8.00	0.00	-0.00	-0.00	-8.00	-0.00	-0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
0.00	9.00	0.00	-0.00	-0.00	-0.00	-9.00	-0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
0.00	10.00	0.00	-0.00	-0.00	-0.00	-0.00	-10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00
0.00	0.00	3.00	-3.00	-0.00	-0.00	-0.00	-0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
0.00	0.00	5.00	-0.00	-5.00	-0.00	-0.00	-0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00
0.00	0.00	7.00	-0.00	-0.00	-7.00	-0.00	-0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00
0.00	0.00	11.00	-0.00	-0.00	-0.00	-11.00	-0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	13.00	-0.00	-0.00	-0.00	-0.00	-13.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	200.00	200.00	-100.00	-100.00	-100.00	-100.00	-100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Iterations

Iterations: 0 (initial tableau)

3. Click “Iterate!” to see the simplex’s iterations one by one. A new table will appear below the initial tableau. The current number of iterations is indicated below the iterated tableau.

Choose CSV file

Browse...

simplex_1.csv

Upload complete

Polynomial Regression

Quadratic Spline

Simplex

Initial Tableau

Iterate!

Show Final Answer

V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11	V12	V13	V14	V15	V16	V17	V18	V19	V20	V
5.00	0.00	0.00	-5.00	-0.00	-0.00	-0.00	-0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6.00	0.00	0.00	-0.00	-6.00	-0.00	-0.00	-0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7.00	0.00	0.00	-0.00	-0.00	-7.00	-0.00	-0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8.00	0.00	0.00	-0.00	-0.00	-0.00	-8.00	-0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9.00	0.00	0.00	-0.00	-0.00	-0.00	-0.00	-9.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	6.00	0.00	-6.00	-0.00	-0.00	-0.00	-0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	7.00	0.00	-7.00	-0.00	-0.00	-0.00	-0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	8.00	0.00	-0.00	-0.00	-8.00	-0.00	-0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
0.00	9.00	0.00	-0.00	-0.00	-0.00	-9.00	-0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
0.00	10.00	0.00	-0.00	-0.00	-0.00	-0.00	-10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00
0.00	0.00	3.00	-3.00	-0.00	-0.00	-0.00	-0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
0.00	0.00	5.00	-0.00	-5.00	-0.00	-0.00	-0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00
0.00	0.00	7.00	-0.00	-0.00	-7.00	-0.00	-0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00
0.00	0.00	11.00	-0.00	-0.00	-0.00	-11.00	-0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	13.00	-0.00	-0.00	-0.00	-0.00	-13.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	200.00	200.00	-100.00	-100.00	-100.00	-100.00	-100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Iterations

V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11	V12	V13	V14	V15	V16	V17	V18	V19	V20	V
-1.00	-0.00	-0.00	1.00	0.00	0.00	0.00	-0.20	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00
6.00	0.00	0.00	-0.00	-6.00	-0.00	-0.00	-0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7.00	0.00	0.00	-0.00	-0.00	-7.00	-0.00	-0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8.00	0.00	0.00	-0.00	-0.00	-0.00	-8.00	-0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9.00	0.00	0.00	-0.00	-0.00	-0.00	-0.00	-9.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	8.00	0.00	-0.00	-0.00	-8.00	-0.00	-0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
0.00	9.00	0.00	-0.00	-0.00	-0.00	-9.00	-0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
0.00	10.00	0.00	-0.00	-0.00	-0.00	-0.00	-10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00
0.00	0.00	3.00	-3.00	-0.00	-0.00	-0.00	-0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
0.00	0.00	5.00	-0.00	-5.00	-0.00	-0.00	-0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00
0.00	0.00	7.00	-0.00	-0.00	-7.00	-0.00	-0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00
0.00	0.00	11.00	-0.00	-0.00	-0.00	-11.00	-0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	13.00	-0.00	-0.00	-0.00	-0.00	-13.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	200.00	200.00	-100.00	-100.00	-100.00	-100.00	-100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Iterations

V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11	V12	V13	V14	V15	V16	V17	V18	V19	V20	V
-1.00	-0.00	-0.00	1.00	0.00	0.00	0.00	-0.20	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00
6.00	0.00	0.00	-0.00	-6.00	-0.00	-0.00	-0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7.00	0.00	0.00	-0.00	-0.00	-7.00	-0.00	-0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8.00	0.00	0.00	-0.00	-0.00	-0.00	-8.00	-0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9.00	0.00	0.00	-0.00	-0.00	-0.00	-0.00	-9.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-6.00	6.00	0.00	0.00	0.00	0.00	0.00	0.00	-1.20	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	7.00	0.00	-0.00	-7.00	-0.00	-0.00	-0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	8.00	0.00	-0.00	-0.00	-8.00	-0.00	-0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
0.00	9.00	0.00	-0.00	-0.00	-0.00	-9.00	-0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
0.00	10.00	0.00	-0.00	-0.00	-0.00	-0.00	-10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00
-3.00	0.00	3.00	0.00	0.00	0.00	0.00	0.00	-0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
0.00	0.00	5.00	-0.00	-5.00	-0.00	-0.00	-0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00
0.00	0.00	7.00	-0.00	-0.00	-7.00	-0.00	-0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	11.00	-0.00	-0.00	-0.00	-11.00	-0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	13.00	-0.00	-0.00	-0.00	-0.00	-13.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	200.00	200.00	0.00	-100.00	-100.00	-100.00	-100.00	-20.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Iterations: 1

4. Click “Final Answer” to see the simplex’s final answer.

Notes:

- > The generic solvers are designed to read .csv files without headers/column names.

Github repo: <https://github.com/juuuleees/150-proj-AY1920>