

USER MANUAL

For R Shiny data tool

SIMPLEX, QSI, AND
REGRESSION

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WHAT IS THE PURPOSE OF THIS PROGRAM

The purpose of this program is to make the computation of Simplex, Polynomial Regression, and Quadratic Spline Interpolation easier with the help of programming in R using computers instead of manually solving it.

Furthermore, it proves that it using these ideas, we can make a different marketable applications such as the diet solver that can be used for everyday lives especially if the data there are more complex.

INSTRUCTIONS

POLYNOMIAL REGRESSION

1. Upload a valid CSV file

Choose a CSV file

Browse... input_Regression.csv

Upload complete

2. Enter a valid Degree and Integer

Enter a Degree:

4

Enter an Integer:

150

3. Resulting Output

Function

function(x) 39.7166999760158 +
-0.0519965423005998 * x^1 +
0.000127798367305103 * x^2 +
-1.68663251807435e-07 * x^3 +
7.44389229516476e-11 * x^4

Estimate

34.26113

	A	B
1	100	36
2	150	33.8
3	200	33
4	250	32.4
5	300	31.8
6	400	30.8
7	500	29.3
8	600	27.6
9	650	26.7
10	700	25.8
11	750	24.9
12	800	24.1
13	850	23.4
14	900	22.8
15	950	21.1
16	1000	21.4

Example of CSV File

INSTRUCTIONS

QUADRATIC SPLINE INTERPOLATION

1. Upload a valid CSV file

Choose a CSV file

input_QSI.csv

Upload complete

2. Enter a valid Integer input

Enter an Integer:

19

	A	B
1	9	4
2	15	6.1
3	16.5	2
4	20	2.3

Example of CSV File

3. Resulting Output

Function per Interval

```
9 <= x <= 15 : function(x) 0*(x^2) + 0.349999999999987*x + 0.850000000000025
15 <= x <= 16.5 : function(x) -2.05555555555557*(x^2) + 62.016666666667*x +
-461.6500000000005
16.5 <= x <= 20 : function(x) 1.68639455782314*(x^2) + -61.4676870748303*x +
557.09591836735
```

Function for the Estimate

```
function(x) 1.68639455782314*(x^2) + -61.4676870748303*x + 557.09591836735
```

Estimate

```
-2.00170068027217
```

INSTRUCTIONS

DIET SOLVER USING SIMPLEX METHOD

1. Check food item's that you want to use.

Select food Items:

- ☒ Frozen_Broccoli
- ☒ Carrots_Raw
- ☒ Celery_Raw
- ☒ Frozen_Corn
- ☒ Lettuce_Iceberg_Raw
- ☒ Peppers_Sweet_Raw
- ☒ Potatoes_Baked
- ☒ Tofu
- ☒ Roasted_Chicken
- ☒ Spaghetti
- ☒ Tomato_Red_Ripe_Raw
- ☒ Apple_Raw_W_Skin
- ☒ Banana
- ☒ Grapes
- ☒ Kiwifruit_Raw_Fresh
- ☒ Oranges
- ☒ Bagels
- ☒ Wheat_Bread
- ☒ White_Bread
- ☒ Oatmeal_Cookies
- ☐ Apple_Pie
- ☐ Chocolate_Chip_Cookies

Note: Check a valid combination of foods or else the output will be infeasible.

5. You may check how the computation works below the compute button.

2. Press Select All if you want all the foods to be checked, and remove all if you want to reset your chosen food items.

Select All

Remove All

3. Press compute to run the simplex implementation,

Compute

4. Resulting output for serving size, price and final cost in dollars.

Output Table

FOOD	SERVING_SIZE	PRICE
Frozen_Broccoli	1.50	0.24
Potatoes_Baked	0.37	0.02
Tofu	1.63	0.50
Roasted_Chicken	0.44	0.37
Wheat_Bread	1.56	0.08
White_Bread	10.00	0.60
Oatmeal_Cookies	10.00	0.90

The minimized cost is 2.71149629661869

WHAT IS THE PURPOSE OF SIMPLEX IN DIET SOLVER

The purpose of Simplex is to compute the minimum cost and minimum serving of a user to be used when they wanted to buy the foods they wanted to eat for their diet with a given constraints for nutrition and servings. In this method, we can assure that all of the constraints given will be satisfied and at the same time, the resulting cost will be minimized to avoid spending more money.