

solveR

USER MANUAL

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CMSC 150 - AB5L

Welcome! solveR is a web application built using R and Shiny that currently contains calculators for Polynomial Regression and Quadratic Spline Interpolation, and a diet solver that gives the optimal cost of a diet needed to meet nutritional constraints. This is submitted as the final project for CMSC 150 - Numerical and Symbolic Computation.

Requirements:

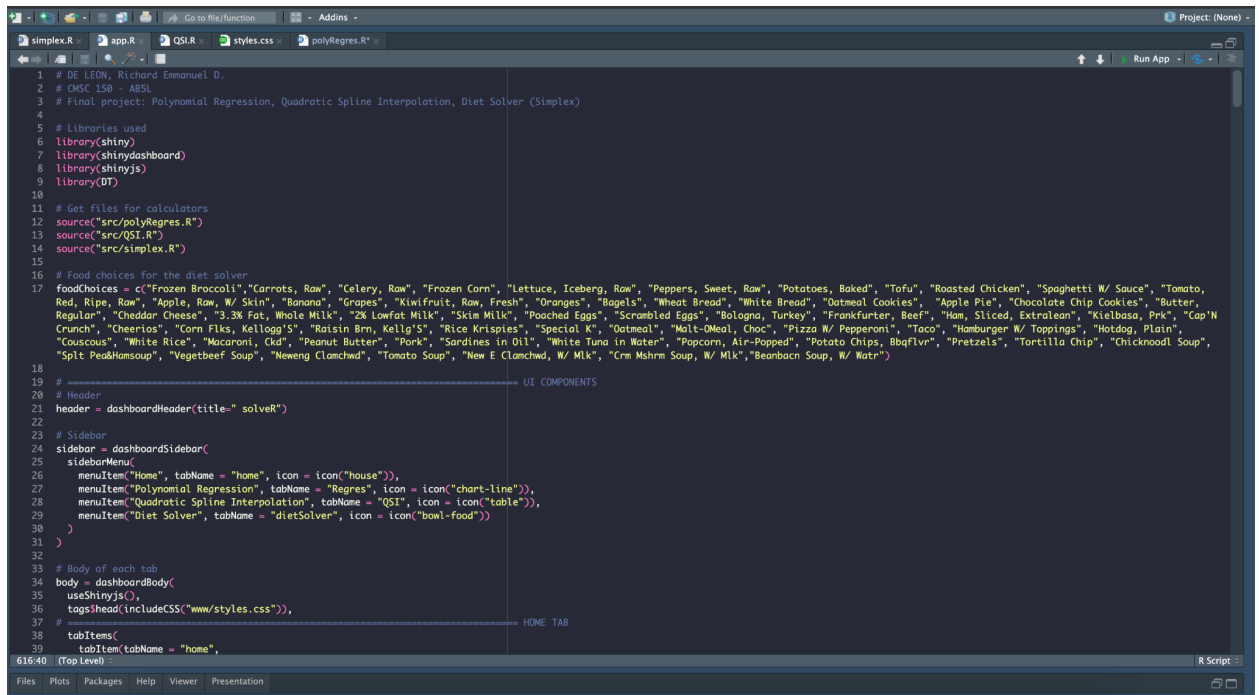
- 1.) Install R and R Studio
- 2.) Install dependencies
 - a.) `install.packages("shiny")`
 - b.) `install.packages("shinydashboard")`
 - c.) `install.packages("shinyjs")`
 - d.) `install.packages("DT")`

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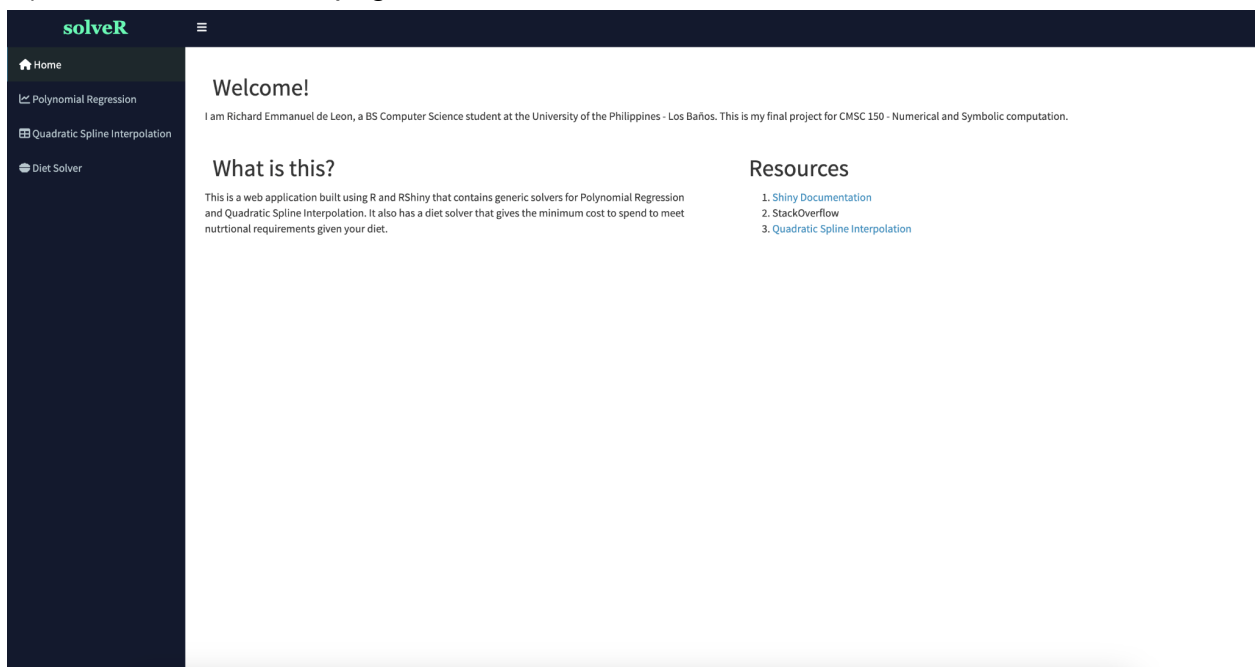
Launching the Application

1.) To start the application, open app.R and click run app.



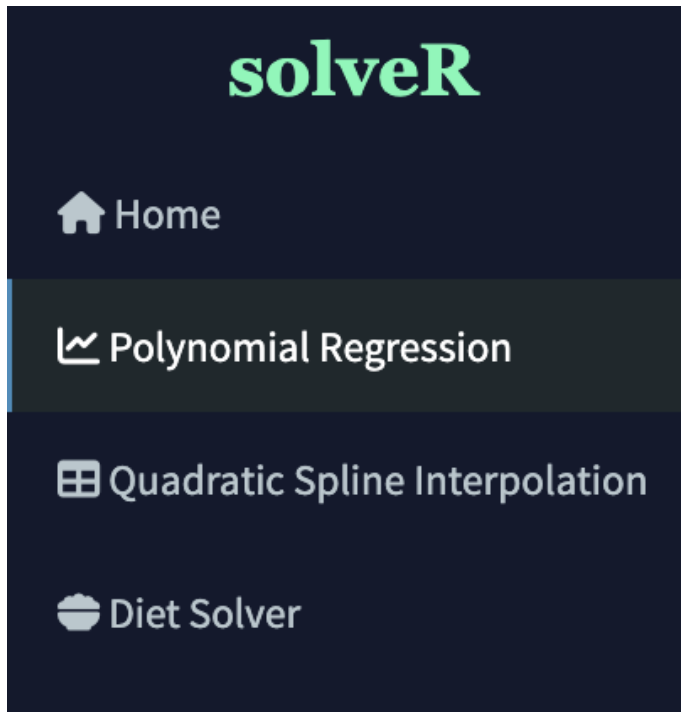
```
1 # DE LEON, Richard Emmanuel D.
2 # CMSC 150 - ABSL
3 # Final project: Polynomial Regression, Quadratic Spline Interpolation, Diet Solver (Simplex)
4
5 # Libraries used
6 library(shiny)
7 library(shinydashboard)
8 library(shinyjs)
9 library(DT)
10
11 # Get files for calculators
12 source("src/polyRegRes.R")
13 source("src/QSI.R")
14 source("src/simplex.R")
15
16 # Food choices for the diet solver
17 foodChoices = c("Frozen Broccoli", "Carrots, Raw", "Celery, Raw", "Frozen Corn", "Lettuce, Iceberg, Raw", "Peppers, Sweet, Raw", "Potatoes, Baked", "Tofu", "Roasted Chicken", "Spaghetti W/ Sauce", "Tomato, Red, Ripe, Raw", "Apple, Raw, W/ Skin", "Banana", "Grapes", "Kiwi/Fruit, Raw, Fresh", "Oranges", "Bagels", "Wheat Bread", "White Bread", "Oatmeal Cookies", "Apple Pie", "Chocolate Chip Cookies", "Butter, Regular", "Cheddar Cheese", "3.2% Fat, Whole Milk", "2% Lowfat Milk", "Skim Milk", "Poached Eggs", "Scrambled Eggs", "Bologna, Turkey", "Frankfurter, Beef", "Ham, Sliced, Extralean", "Kielbasa, Prk", "Cap'n Crunch", "Cheerios", "Corn Flks, Kellogg's", "Raisin Brn, Kellogg's", "Rice Krispies", "Special K", "Oatmeal", "Malt-O-Meal, Choc", "Pizza W/ Pepperoni", "Taco", "Hamburger W/ Toppings", "Hotdog, Plain", "Couscous", "White Rice", "Macaroni, Ckd", "Peanut Butter", "Pork", "Sardines in Oil", "White Tuna in Water", "Popcorn, Air-Popped", "Potato Chips, Bqflvr", "Pretzels", "Tortilla Chip", "Chicknoodl Soup", "Split Pea&Hamsoup", "Vegetbeef Soup", "Neweng Clamchwd", "Tomato Soup", "New E Clamchwd, W/ Mlk", "Crn Mshrm Soup, W/ Mlk", "Beanbacn Soup, W/ Watr")
18
19
20 # UI COMPONENTS
21 # Header
22 header = dashboardHeader(title=" solveR")
23
24 # Sidebar
25 sidebar = dashboardSidebar(
26   sidebarMenu(
27     menuItem("Home", tabName = "home", icon = icon("house")),
28     menuItem("Polynomial Regression", tabName = "Regres", icon = icon("chart-line")),
29     menuItem("Quadratic Spline Interpolation", tabName = "QSI", icon = icon("table")),
30     menuItem("Diet Solver", tabName = "dietSolver", icon = icon("bowl-food"))
31   )
32 )
33
34 # Body of each tab
35 body = dashboardBody(
36   useShinyjs(),
37   tags$head(includeCSS("www/styles.css")),
38   tabItems(
39     tabItem(tabName = "home",
```

2.) You should see this page if successful:



Navigating the Polynomial Regression solver

1.) Go to the Polynomial Regression page



2.) You should see this page when you click the tab

A screenshot of the Polynomial Regression solver interface. At the top is a dark blue header with the 'solveR' logo and a hamburger menu icon. Below the header is a red error banner with the text 'Please enter CSV, order, and estimate' and a warning icon. Underneath the banner is a section titled 'Input' with a dark blue background. This section contains three input fields: 'Enter CSV file here:' with a 'Browse...' button and 'No file selected' text; 'Order' with a text input field; and 'Estimate' with a text input field. At the bottom of the 'Input' section is a dark blue 'Solve' button.

3.) Enter your CSV by clicking this button

Enter CSV file here:

Browse... No file selected

Enter CSV file here:

Browse...

input_Regression.csv

Upload complete

4.) You should see the data points on the top of the page.

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

5.) Enter the order of the polynomial you want to use. (NOTE: You should only put a maximum of n-1 as the order, n = the number of data points).

Order

4

6.) Enter your estimate here.

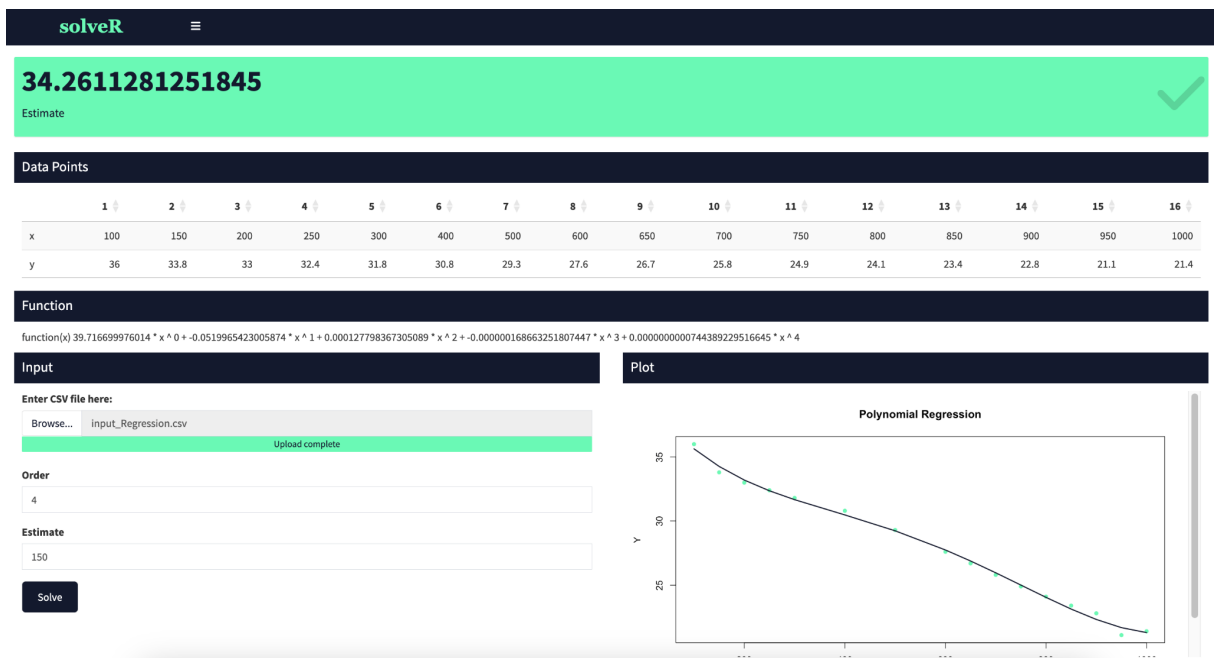
Estimate

150

7.) Click the solve button to solve given your inputs.

Solve

8.) A successful input will result to this page.



9.) You will see the estimate on top of the page.

34.2611281251845

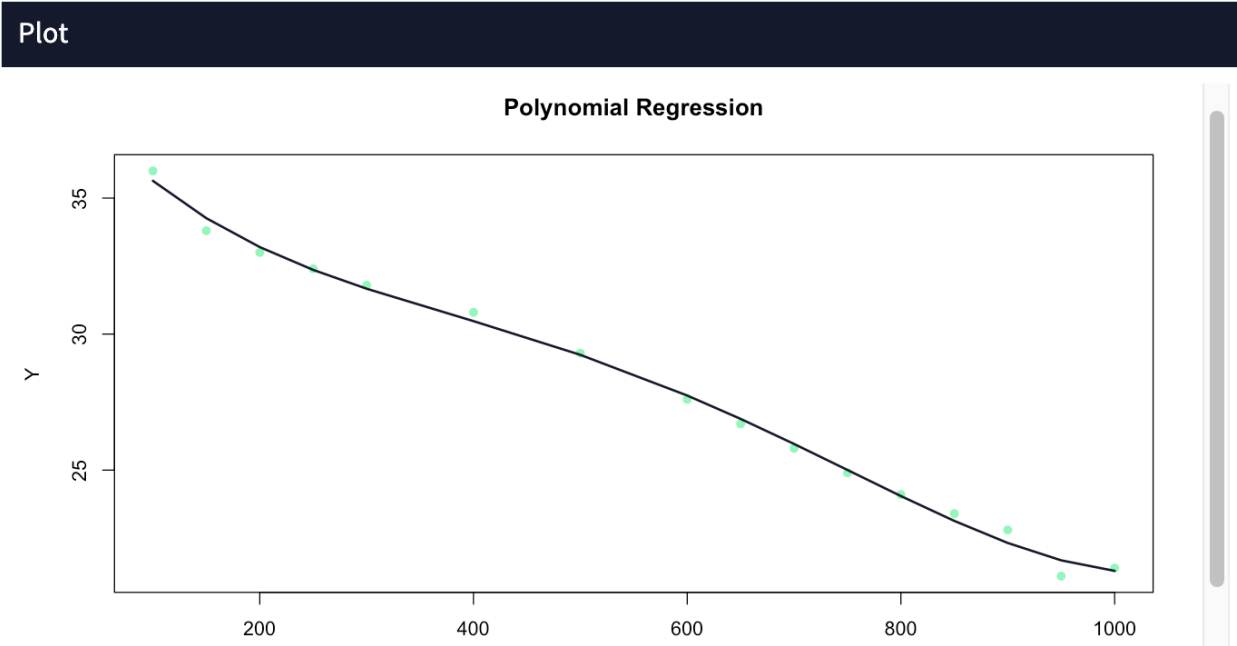
Estimate

10.) Under it is the function string given the order.

Function

function(x) 39.716699976014 * x ^ 0 + -0.0519965423005874 * x ^ 1 + 0.000127798367305089 * x ^ 2 + -0.000000168663251807447 * x ^ 3 + 0.0000000000744389229516645 * x ^ 4

11.) To the right of the page is the plot of the function.



13.) You should see the solution of linear equations on the bottom of the page.
Move the slider to check the iterations.

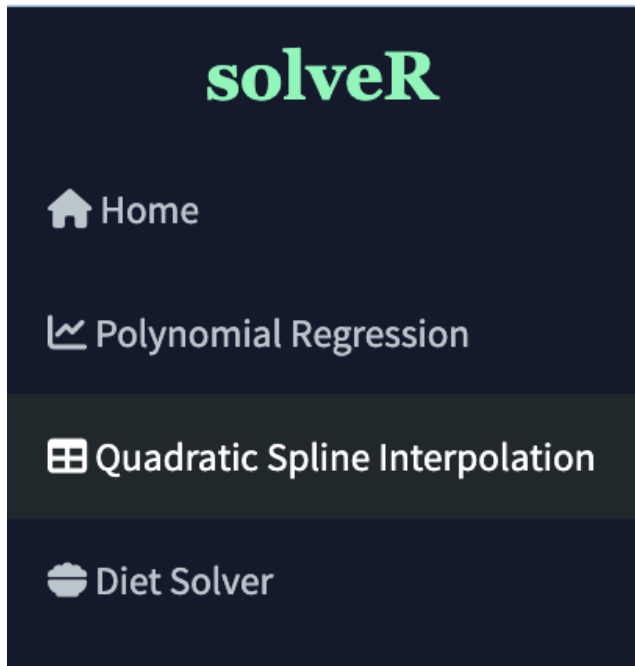
Elimination

Select Iteration: 1

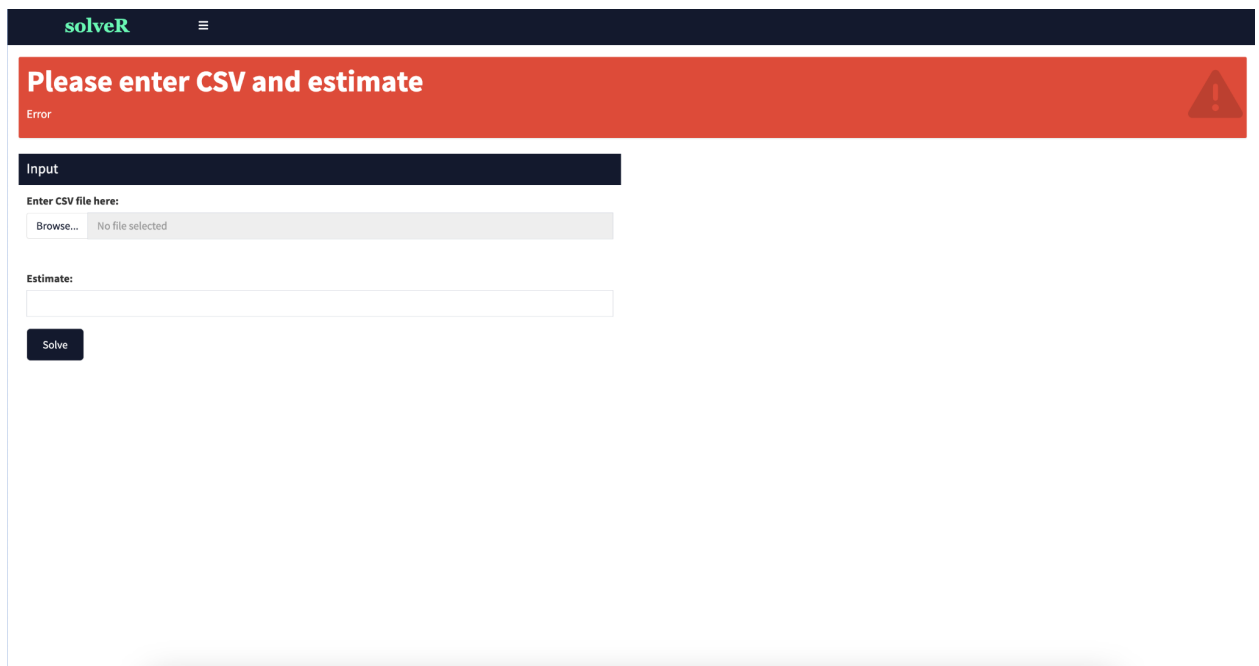
1	2	3	4	5	RHS
16.00	9100.00	6545000.00	5212000000.00	4369137500000.00	444.90
9100.00	6545000.00	5212000000.00	4369137500000.00	3780122500000000.00	231665.00
6545000.00	5212000000.00	4369137500000.00	3780122500000000.00	3344299343750000128.00	158686750.00
5212000000.00	4369137500000.00	3780122500000000.00	3344299343750000128.00	3009525793749999812608.00	122882337500.00
4369137500000.00	3780122500000000.00	3344299343750000128.00	3009525793749999812608.00	2745217197734374678724608.00	101125024375000.00

Navigating the Quadratic Spline Interpolation solver

1.) Go to the Quadratic Spline Interpolation page

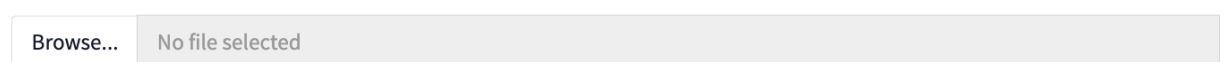


2.) You should see this page upon clicking the tab

The interface of the Quadratic Spline Interpolation solver. At the top is a dark blue header with the 'solveR' logo and a hamburger menu icon. Below the header is a red error banner with the text 'Please enter CSV and estimate' and a warning icon. Underneath the banner is a section titled 'Input' with a dark blue background. It contains a label 'Enter CSV file here:' followed by a file selection area with a 'Browse...' button and the text 'No file selected'. Below this is an 'Estimate:' label followed by a text input field. At the bottom of the input section is a dark blue 'Solve' button.

3.) Enter your CSV file here

Enter CSV file here:

A close-up of the file selection area. It shows a light gray box containing a 'Browse...' button and the text 'No file selected'.

4.) You should see the list of data points upon entering the file

Data Points				
	1	2	3	4
x	9	15	16.5	20
y	4	6.1	2	2.3

5.) Enter your estimate based on the data points

Estimate:

6.) Click the solve button after entering both



7.) After entering valid data, you should see this page

solveR

-2.00170068027217
Estimate

Data Points

	1	2	3	4
x	9	15	16.5	20
y	4	6.1	2	2.3

Input

Enter CSV file here:
Browse... input_QSl.csv
Upload complete

Estimate:
19

Solve

Results

intervals	functions
9 <= x <= 15	function(x) 0 * x ^ 2 + 0.3499999999999987 * x ^ 1 + 0.8500000000000025 * x ^ 0
15 <= x <= 16.5	function(x) -2.055555555555557 * x ^ 2 + 62.0166666666667 * x ^ 1 + -461.65000000000005 * x ^ 0
16.5 <= x <= 20	function(x) 1.68639455782314 * x ^ 2 + -61.4676870748303 * x ^ 1 + 557.09591836735 * x ^ 0

Elimination

Select Iteration:
1

a1 b1 c1 a2 b2 c2 a3 b3 c3 RHS

8.) You will see the estimate based on the intervals on the top part of the page

-2.00170068027217
Estimate

9.) You should see the intervals on the right side of the page

Results

intervals	functions
$9 \leq x \leq 15$	$\text{function}(x) 0 * x^2 + 0.3499999999999987 * x^1 + 0.8500000000000025 * x^0$
$15 \leq x \leq 16.5$	$\text{function}(x) -2.055555555555557 * x^2 + 62.0166666666667 * x^1 + -461.6500000000005 * x^0$
$16.5 \leq x \leq 20$	$\text{function}(x) 1.68639455782314 * x^2 + -61.4676870748303 * x^1 + 557.09591836735 * x^0$

10.) You can also see the solution for the system of linear equations on the bottom side of the page. Moving the slider adjusts the iteration number.

Elimination										
Select Iteration:										
<div><div></div><div>7</div><div>10</div></div>										
a1	b1	c1	a2	b2	c2	a3	b3	c3	RHS	
1.00	0.00	0.00	0.00	0.00	0.00	5.50	0.17	0.00	-0.97	
0.00	1.00	0.00	0.00	0.00	0.00	-132.00	-4.00	0.00	23.62	
0.00	0.00	1.00	0.00	0.00	0.00	742.50	22.50	0.00	-130.02	
0.00	0.00	0.00	1.00	0.00	0.00	-22.00	-0.67	0.00	1.82	
0.00	0.00	0.00	0.00	1.00	0.00	693.00	21.00	0.00	-60.13	
0.00	0.00	0.00	0.00	0.00	1.00	-5445.00	-165.00	0.00	498.10	
0.00	0.00	0.00	0.00	0.00	0.00	272.25	16.50	1.00	2.00	
0.00	0.00	0.00	0.00	0.00	0.00	400.00	20.00	1.00	2.30	
0.00	0.00	0.00	0.00	0.00	0.00	-5.50	-0.17	0.00	0.97	

11.) An invalid input will show this page. Make sure to check your inputs.

solveR

Enter valid estimate

Error

Data Points

	1	2	3	4
x	9	15	16.5	20
y	4	6.1	2	2.3

Input

Enter CSV file here:

Browse...

input_QSI.csv

Upload complete

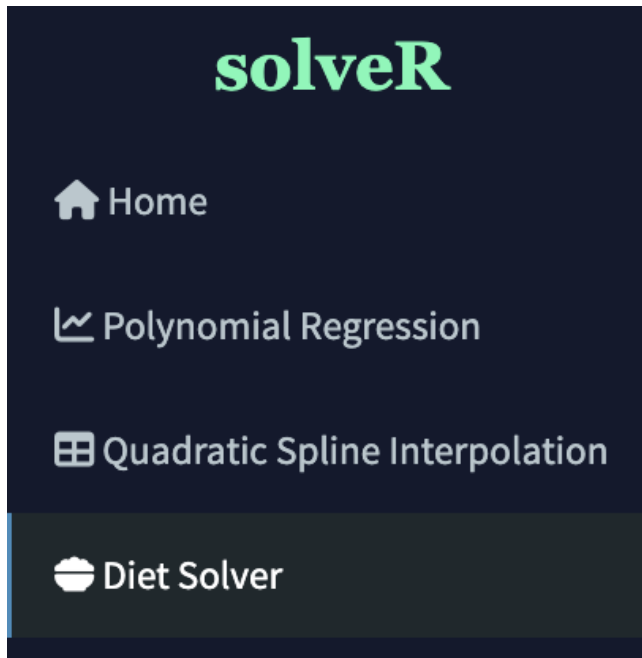
Estimate:

50

Solve

Navigating the Diet Solver (Simplex)

1.) Click the Diet Solver tab



2.) After clicking, you will be redirected to this page

solveR

Select your food choices:

☐ Frozen Broccoli

☐ Carrots, Raw

☐ Celery, Raw

☐ Frozen Corn

☐ Lettuce, Iceberg, Raw

☐ Peppers, Sweet, Raw

☐ Potatoes, Baked

☐ Tofu

☐ Roasted Chicken

☐ Spaghetti W/ Sauce

☐ 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

☐ Butter, Regular

☐ Cheddar Cheese

☐ 3.3% Fat, Whole Milk

☐ 2% Lowfat Milk

☐ Skim Milk

☐ Poached Eggs

☐ Scrambled Eggs

☐ Bologna, Turkey

☐ Frankfurter, Beef

☐ Ham, Sliced, Extralean

☐ Kielbasa, Prk

☐ Cap'N Crunch

☐ Cheerios

☐ Corn Flks, Kellogg'S

☐ Raisin Brn, Kellig'S

☐ Rice Krispies

☐ Special K

☐ Oatmeal

☐ Malt-O-Meal, Choc

☐ Pizza W/ Pepperoni

☐ Taco

☐ Hamburger W/ Toppings

☐ Hotdog, Plain

☐ Couscous

☐ White Rice

☐ Macaroni, Ckd

☐ Peanut Butter

☐ Pork

☐ Sardines in Oil

☐ White Tuna in Water

☐ Popcorn, Air-Popped

☐ Potato Chips, Bbqflvr

☐ Pretzels

☐ Tortilla Chip

☐ Chicknoodl Soup

☐ Splt Pea&Hamsoup

☐ Vegetbeef Soup

☐ Neweng Clamchwd

☐ Tomato Soup

☐ New E Clamchwd, W/ Milk

☐ Crm Mshrm Soup, W/ Milk

☐ Beanbacn Soup, W/ Watr

Select All

Reset

Solve

No input

Please select your food

3.) Click the checkboxes of your diet.

Select your food choices:

☒ Frozen Broccoli

☐ Carrots, Raw

☐ Celery, Raw

☐ Frozen Corn

☐ Lettuce, Iceberg, Raw

☐ Peppers, Sweet, Raw

☒ Potatoes, Baked

☒ Tofu

☒ Roasted Chicken

☐ Spaghetti W/ Sauce

☐ 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

☐ Butter, Regular

☐ Cheddar Cheese

☐ 3.3% Fat, Whole Milk

☐ 2% Lowfat Milk

☐ Skim Milk

☐ Poached Eggs

☐ Scrambled Eggs

☐ Bologna, Turkey

☐ Frankfurter, Beef

☐ Ham, Sliced, Extralean

☐ Kielbasa, Prk

☐ Cap'N Crunch

☐ Cheerios

☐ Corn Flks, Kellogg'S

☐ Raisin Brn, Kellig'S

☐ Rice Krispies

☐ Special K

☐ Oatmeal

☐ Malt-O-Meal, Choc

☐ Pizza W/ Pepperoni

☐ Taco

☐ Hamburger W/ Toppings

☐ Hotdog, Plain

☐ Couscous

☐ White Rice

☐ Macaroni, Ckd

☐ Peanut Butter

☐ Pork

☐ Sardines in Oil

☐ White Tuna in Water

☐ Popcorn, Air-Popped

☐ Potato Chips, Bbqflvr

☐ Pretzels

☐ Tortilla Chip

☐ Chicknoodl Soup

☐ Splt Pea&Hamsoup

☐ Vegetbeef Soup

☐ Neweng Clamchwd

☐ Tomato Soup

☐ New E Clamchwd, W/ Milk

☐ Crm Mshrm Soup, W/ Milk

☐ Beanbacn Soup, W/ Watr

4.) You could also select all of the foods by clicking the the “Select all” button and reset the clicking the “Reset” button.

Select your food choices:

☒ Frozen Broccoli
☒ Carrots, Raw
☒ Celery, Raw
☒ Frozen Corn
☒ Lettuce, Iceberg, Raw
☒ Peppers, Sweet, Raw
☒ Potatoes, Baked
☒ Tofu
☒ Roasted Chicken
☒ Spaghetti W/ Sauce
☒ 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
☒ Butter, Regular
☒ Cheddar Cheese
☒ 3.3% Fat, Whole Milk
☒ 2% Lowfat Milk

☒ Skim Milk
☒ Poached Eggs
☒ Scrambled Eggs
☒ Bologna, Turkey
☒ Frankfurter, Beef
☒ Ham, Sliced, Extralean
☒ Kielbasa, Prk
☒ Cap'N Crunch
☒ Cheerios
☒ Corn Flks, Kellogg'S
☒ Raisin Brn, Kellg'S
☒ Rice Krispies
☒ Special K

☒ Oatmeal
☒ Malt-OMeal, Choc
☒ Pizza W/ Pepperoni
☒ Taco
☒ Hamburger W/ Toppings
☒ Hotdog, Plain
☒ Couscous
☒ White Rice
☒ Macaroni, Ckd
☒ Peanut Butter
☒ Pork
☒ Sardines in Oil
☒ White Tuna in Water

☒ Popcorn, Air-Popped
☒ Potato Chips, Bbqflvr
☒ Pretzels
☒ Tortilla Chip
☒ Chicknoodl Soup
☒ Split Pea&Hamsoup
☒ Vegetbeef Soup
☒ Neweng Clamchwd
☒ Tomato Soup
☒ New E Clamchwd, W/ Milk
☒ Crm Mshrm Soup, W/ Milk
☒ Beanbacn Soup, W/ Watr

Select your food choices:

☐ Frozen Broccoli
☐ Carrots, Raw
☐ Celery, Raw
☐ Frozen Corn
☐ Lettuce, Iceberg, Raw
☐ Peppers, Sweet, Raw
☐ Potatoes, Baked
☐ Tofu
☐ Roasted Chicken
☐ Spaghetti W/ Sauce
☐ 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
☐ Butter, Regular
☐ Cheddar Cheese
☐ 3.3% Fat, Whole Milk
☐ 2% Lowfat Milk

☐ Skim Milk
☐ Poached Eggs
☐ Scrambled Eggs
☐ Bologna, Turkey
☐ Frankfurter, Beef
☐ Ham, Sliced, Extralean
☐ Kielbasa, Prk
☐ Cap'N Crunch
☐ Cheerios
☐ Corn Flks, Kellogg'S
☐ Raisin Brn, Kellg'S
☐ Rice Krispies
☐ Special K

☐ Oatmeal
☐ Malt-OMeal, Choc
☐ Pizza W/ Pepperoni
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☐ Hotdog, Plain
☐ Couscous
☐ White Rice
☐ Macaroni, Ckd
☐ Peanut Butter
☐ Pork
☐ Sardines in Oil
☐ White Tuna in Water

☐ Popcorn, Air-Popped
☐ Potato Chips, Bbqflvr
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☐ Vegetbeef Soup
☐ Neweng Clamchwd
☐ Tomato Soup
☐ New E Clamchwd, W/ Milk
☐ Crm Mshrm Soup, W/ Milk
☐ Beanbacn Soup, W/ Watr

Select All

Reset

Solve

5.) You should see this upon choosing foods that have a feasible solution

\$ 2.71

Optimal Cost

\$

Cost breakdown

Final Tableau

Select Iteration:

1

11

Simplex iterations

6.) You could see the cost breakdown by clicking on the box

Cost breakdown		
Food	Servings	Cost
Frozen Broccoli	1.50	0.24
Potatoes, Baked	0.37	0.02
Tofu	1.63	0.51
Roasted Chicken	0.44	0.37
Wheat Bread	1.56	0.08
White Bread	10.00	0.60
Oatmeal Cookies	10.00	0.90

7.) You can also view the final tableau

Final Tableau															
Calories	Cholesterol mg	Total_Fat g	Sodium mg	Carbohydrates g	Dietary_Fiber g	Protein g	Vit_A IU	Vit_C IU	Calcium mg	Iron mg	Calories	Cholesterol mg	Total_Fat g	Sodium mg	Carbohydrate g
0.00	-0.02	0.00	0.00	0.00	-0.06	-0.04	-46.49	-1.25	-1.00	0.00	0.00	0.02	-0.00	0.00	0.00
-1.00	-0.56	-0.03	0.00	0.00	-0.00	-0.17	-6.14	-0.18	0.00	0.00	1.00	0.56	0.03	0.00	0.00
0.00	-16.17	2.36	0.00	0.00	-1.01	-4.87	-548.74	-17.95	0.00	0.00	0.00	16.17	-2.36	0.00	0.00
0.00	-7.71	0.58	0.00	0.00	-0.97	-1.48	-996.08	-27.55	0.00	1.00	0.00	7.71	-0.58	0.00	0.00
0.00	-0.69	-0.09	0.00	0.00	-0.89	-0.72	-595.57	-15.79	0.00	0.00	0.00	0.69	0.09	0.00	0.00
0.00	-1.54	-0.20	0.00	1.00	0.14	-0.48	57.08	1.95	0.00	0.00	0.00	1.54	0.20	0.00	-1.00
0.00	-0.09	0.01	1.00	0.00	-0.00	-0.02	-6.78	-0.22	0.00	0.00	0.00	0.09	-0.01	-1.00	0.00
250.00	243.23	5.49	0.00	0.00	64.79	15.48	40999.21	19753.44	800.00	0.00	0.00	56.77	59.51	2400.00	300.00
Calories	Cholesterol mg	Total_Fat g	Sodium mg	Carbohydrates g	Dietary_Fiber g	Protein g	Vit_A IU	Vit_C IU	Calcium mg	Iron mg	Calories	Cholesterol mg	Total_Fat g	Sodium mg	Carbohydrate g
250.00	243.23	5.49	0.00	0.00	64.79	15.48	40999.21	19753.44	800.00	0.00	0.00	56.77	59.51	2400.00	300.00

8.) You can also view the iterations of the simplex method using the slider

Select Iteration:

11

Simplex iterations															
Calories	Cholesterol mg	Total_Fat g	Sodium mg	Carbohydrates g	Dietary_Fiber g	Protein g	Vit_A IU	Vit_C IU	Calcium mg	Iron mg	Calories	Cholesterol mg	Total_Fat g	Sodium mg	Carbohydrate g
-0.01	-0.00	-0.00	-0.01	-0.00	-0.00	-0.00	-1.00	-0.03	-0.03	-0.00	0.01	0.00	0.00	0.01	0.00
-171.50	0.00	-0.20	-15.20	-39.90	-3.20	-3.70	0.00	-15.60	-22.70	-4.30	171.50	0.00	0.20	15.20	39.90
-86.96	0.00	-5.49	-6.95	-1.97	-1.26	-9.27	0.00	2.59	-119.13	-6.16	86.96	0.00	5.49	6.95	1.97
-276.43	-129.90	-10.79	-124.70	0.18	0.11	-42.09	0.00	2.11	-19.80	-1.77	276.43	129.90	10.79	124.70	-0.18
-65.00	0.00	-1.00	-134.50	-12.40	-1.30	-2.20	0.00	0.00	-10.80	-0.70	65.00	0.00	1.00	134.50	12.40
-65.00	0.00	-1.00	-132.50	-11.80	-1.10	-2.30	0.00	0.00	-26.20	-0.80	65.00	0.00	1.00	132.50	11.80
-80.96	0.00	-3.30	-68.87	-12.39	-0.60	-1.10	0.00	-0.02	-6.62	-0.50	80.96	0.00	3.30	68.87	12.39
2187.11	300.00	64.32	2341.88	288.41	92.76	93.18	45000.00	19863.48	1464.51	28.04	-1937.11	0.00	0.68	58.12	11.80
Calories	Cholesterol mg	Total_Fat g	Sodium mg	Carbohydrates g	Dietary_Fiber g	Protein g	Vit_A IU	Vit_C IU	Calcium mg	Iron mg	Calories	Cholesterol mg	Total_Fat g	Sodium mg	Carbohydrates g
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

9.) Selecting a selection of foods with an infeasible solution will show this page.

Select your food choices:

☒ Frozen Broccoli
☒ Carrots, Raw
☒ Celery, Raw
☒ Frozen Corn
☒ Lettuce, Iceberg, Raw
☒ Peppers, Sweet, Raw
☐ Potatoes, Baked
☐ Tofu
☐ Roasted Chicken
☐ Spaghetti W/ Sauce
☐ 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
☐ Butter, Regular
☐ Cheddar Cheese
☐ 3.3% Fat, Whole Milk
☐ 2% Lowfat Milk

☐ Skim Milk
☐ Poached Eggs
☐ Scrambled Eggs
☐ Bologna, Turkey
☐ Frankfurter, Beef
☐ Ham, Sliced, Extralean
☐ Kielbasa, Prk
☐ Cap'N Crunch
☐ Cheerios
☐ Corn Flks, Kellogg'S
☐ Raisin Brn, Kellogg'S
☐ Rice Krispies
☐ Special K

☐ Oatmeal
☐ Malt-OMeal, Choc
☐ Pizza W/ Pepperoni
☐ Taco
☐ Hamburger W/ Toppings
☐ Hotdog, Plain
☐ Couscous
☐ White Rice
☐ Macaroni, Ckd
☐ Peanut Butter
☐ Pork
☐ Sardines in Oil
☐ White Tuna in Water

☐ Popcorn, Air-Popped
☐ Potato Chips, Bbqflvr
☐ Pretzels
☐ Tortilla Chip
☐ Chicknoodl Soup
☐ Splt Pea&Hamsoup
☐ Vegetbeef Soup
☐ Neweng Clamchwd
☐ Tomato Soup
☐ New E Clamchwd, W/ Mlk
☐ Crm Mshrm Soup, W/ Mlk
☐ Beanbacn Soup, W/ Watr

Select All

Reset

Solve

INFEASIBLE

Cannot meet nutritional requirements