

PACKAGES TO INSTALL:

- > RShiny
- > Shiny Themes

Shiny is an R package that makes it easy to build interactive web applications (apps) straight from R.

If you still haven't installed the Shiny package, open an R session, connect to the internet, and run

```
install.packages("shiny")  
install.packages("shinythemes")
```



INITIAL PAGE

CMSC 150

~/BSCS/CMSC 150/project - Shiny

http://127.0.0.1:4242/ Open in browser Publish

Numerical Analysis Application POLYNOMIAL REGRESSION QSI DIET PROBLEM SOLVER ABOUT

Input:

☒ First row contains labels

Choose CSV File

BROWSE... No file select

Enter Degree:

0 2 10

Enter X Value

1

SUBMIT

Output

Initial Table

Coefficients

Function

F(x)

User File

NAVIGATION BAR

- > Polynomial Regression
- > Quadratic Spline Interpolation
- > Diet Problem Solver
- > About

MAPUTE, A.M.

Numerical Analysis Application

POLYNOMIAL REGRESSION

QSI

DIET PROBLEM SOLVER

ABOUT

Input:

☐ First row contains labels

Choose CSV File

BROWSE... sampleInput

Upload complete

Enter Degree:

0 2 4

Enter X Value

1

SUBMIT

Output

Initial Table

V1	V2	V3	V4
5.00	15.00	55.00	23030.00
15.00	55.00	225.00	74411.00
55.00	225.00	979.00	284525.00

Coefficients

2644.200000 845.385714 -52.214286

Function

function(x) 2644.19999999999 + 845.385714285722 * x ^ 1 + -52.214285714287 * x ^ 2

F(x)

3437.37142857142

User File

x	y
1	4141
2	3530
3	2277
4	9031
5	4051

[1] UPLOAD A FILE

- * tick check-box if first row of file are column names
- * only files of type ".csv" is available

[2] SLIDE TO SELECT DEGREE

[3] INPUT X VALUE TO BE ESTIMATED

OUTPUT

- > Initial table
- > Coefficients
- > Regression Function
- > Function Estimate

[4] SUBMIT

MAPUTE, A.M.

Numerical Analysis Application | POLYNOMIAL REGRESSION | **QSI** | DIET PROBLEM SOLVER | ABOUT

Input:

☐ First row contains labels

Choose CSV File

BROWSE... sampleInput

Upload complete

Enter X Value

2.5

SUBMIT

Output

Unknowns

a	b	c
0.00	-611.00	4752.00
-642.00	1957.00	2184.00
8649.00	-53789.00	85803.00
-20383.00	178467.00	-378709.00

f(x) per interval

```
[[1]]
function(x) 0 * x ^ 2 + -611 * x + 4752
<environment: 0x0000025e0856c9a0>

[[2]]
function(x) -641.9999999999 * x ^ 2 + 1956.9999999998 * x + 2184.
<environment: 0x0000025e0856c9a0>

[[3]]
function(x) 8648.9999999997 * x ^ 2 + -53788.9999999999 * x + 8580
<environment: 0x0000025e0856c9a0>

[[4]]
function(x) -20383 * x ^ 2 + 178467 * x + -378709
<environment: 0x0000025e0856c9a0>
```

Function used

```
function(x) -641.9999999999 * x ^ 2 + 1956.9999999998 * x + 2184.
<environment: 0x0000025e1b985cc8>
```

f(x) Value

3064

[1] UPLOAD A FILE

- * tick check-box if first row of file are column names
- * only files of type “.csv” is available

[2] INPUT X VALUE TO BE ESTIMATED

- * input values that are within the range of x values

OUTPUT

- > Table of Unknown Values
- > Functions representing each interval
- > Function appropriate for the x value to be estimated
- > Function Estimate

[3] SUBMIT

MAPUTE, A.M.

[1] SELECT ALL WANTED FOOD

Numerical Analysis Application

POLYNOMIAL REGRESSION

QSI

DIET PROBLEM SOLVER

ABOUT

Food Selector

Please select your food.

☒ 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, Extra lean

☐ Kielbasa, Pork

☐ Cap'N Crunch

☐ Cheerios

☐ Corn Flks, Kellogg'S

☐ Raisin Brn, Kellg'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/ Mlk

☐ Crm Mshrm Soup, W/ Mlk

☐ Beanbacn Soup, W/ Watr

UNCHECK ALL

CHECK ALL

SUBMIT SELECTION

[2] ACTION BUTTONS

- * Tick all boxes or Reset
- * Submit

MAPUTE, A.M.

Final Solution

The cost of this optimal diet is \$ 2.71 per day.

Food	Servings	Cost
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

OPTIMAL SOLUTION

Basic Solution Per Iteration

```
$BasicSolution
$BasicSolution[[1]]
  S1 S2  S3  S4  S5  S6 S7      S8      S9 S10  S11  S12 S13  S14  S15  S16 S17 S18      S
-73.8  0 -0.8 -68.2 -13.6 -8.5 -8 -5867.4 -160.2 -159 -2.3 73.8  0 0.06 68.2 13.6 8.5  8 4.524594e-
Serving_9 Serving_10 Serving_11 Serving_12 Serving_13 Serving_14 Serving_15 Serving_16 Serving_17 Ser
  0      0      0      0      0      0      0      0      0      0
Lettuce, Iceberg, Raw Peppers, Sweet, Raw Potatoes, Baked      Tofu Roasted Chicken Spaghetti W/ Sauc
  0.01970138      0.5278838      0.06 0.3095539      0.8396498      0.766176
Bagels Wheat Bread White Bread Oatmeal Cookies      Z
  0.16      0.05      0.06      0.08998688 0.02262297

$BasicSolution[[2]]
  S1 S2  S3  S4  S5  S6 S7      S8      S9 S10  S11      S12 S13  S14  S15  S16 S17 S18
-73.8  0 -0.8 -68.2 -13.6 -8.5 -8 -5867.4 -160.2 -159 -2.3 0.0003498542  0 0.06 68.2 13.6 8.5  8 3.
Serving_8 Serving_9 Serving_10 Serving_11 Serving_12 Serving_13 Serving_14 Serving_15 Serving_16 Servi
  0      0      0      0      0      0      0      0      0      0
Lettuce, Iceberg, Raw Peppers, Sweet, Raw Potatoes, Baked      Tofu Roasted Chicken Spaghetti W/ Sauc
  0.01882713      0.5211374      0.06 0.2787496      0.7426417      0.642496
  Bagels Wheat Bread White Bread Oatmeal Cookies      Z
0.1327114 0.02725948 0.03725948      0.06165024 0.7196517

$BasicSolution[[3]]
  S1 S2  S3  S4  S5  S6 S7      S8      S9 S10  S11      S12 S13  S14  S15  S16 S17 S18
-73.8  0 -0.8 -68.2 -13.6 -8.5 -8 -5867.4 -160.2 -159 -2.3 0.0002485718  0 0.06 68.2 13.6 8.5  8 3.
Serving_7 Serving_8 Serving_9 Serving_10 Serving_11 Serving_12 Serving_13 Serving_14 Serving_15 Servi
```

OUTPUT

- > Final Solution [Optimal Cost & Solution and Cost Breakdown]
- > Basic Solution per Iteration

Tableau

\$InitialTableau														
	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14
food_1	-73.8	0.0	-0.8	-68.2	-13.6	-8.5	-8.0	-5867.4	-160.2	-159.0	-2.3	73.8	0.0	0.8
food_2	-23.7	0.0	-0.1	-19.2	-5.6	-1.6	-0.6	-15471.0	-5.1	-14.9	-0.3	23.7	0.0	0.1
food_3	-6.4	0.0	-0.1	-34.8	-1.5	-0.7	-0.3	-53.6	-2.8	-16.0	-0.2	6.4	0.0	0.1
food_4	-72.2	0.0	-0.6	-2.5	-17.1	-2.0	-2.5	-106.6	-5.2	-3.3	-0.3	72.2	0.0	0.6
food_5	-2.6	0.0	0.0	-1.8	-0.4	-0.3	-0.2	-66.0	-0.8	-3.8	-0.1	2.6	0.0	0.0
food_6	-20.0	0.0	-0.1	-1.5	-4.8	-1.3	-0.7	-467.7	-66.1	-6.7	-0.3	20.0	0.0	0.1
food_7	-171.5	0.0	-0.2	-15.2	-39.9	-3.2	-3.7	0.0	-15.6	-22.7	-4.3	171.5	0.0	0.2
food_8	-88.2	0.0	-5.5	-8.1	-2.2	-1.4	-9.4	-98.6	-0.1	-121.8	-6.2	88.2	0.0	5.5
food_9	-277.4	-129.9	-10.8	-125.6	0.0	0.0	-42.2	-77.4	0.0	-21.9	-1.8	277.4	129.9	10.8
food_10	-358.2	0.0	-12.3	-1237.1	-58.3	-11.6	-8.2	-3055.2	-27.9	-80.2	-2.3	358.2	0.0	12.3
food_11	-25.8	0.0	-0.4	-11.1	-5.7	-1.4	-1.0	-766.3	-23.5	-6.2	-0.6	25.8	0.0	0.4
food_12	-81.4	0.0	-0.5	0.0	-21.0	-3.7	-0.3	-73.1	-7.9	-9.7	-0.2	81.4	0.0	0.5
food_13	-104.9	0.0	-0.5	-1.1	-26.7	-2.7	-1.2	-92.3	-10.4	-6.8	-0.4	104.9	0.0	0.5
food_14	-15.1	0.0	-0.1	-0.5	-4.1	-0.2	-0.2	-24.0	-1.0	-3.4	-0.1	15.1	0.0	0.1
food_15	-46.4	0.0	-0.3	-3.8	-11.3	-2.6	-0.8	-133.0	-74.5	-19.8	-0.3	46.4	0.0	0.3
food_16	-61.6	0.0	-0.2	0.0	-15.4	-3.1	-1.2	-268.6	-69.7	-52.4	-0.1	61.6	0.0	0.2
food_17	-78.0	0.0	-0.5	-151.4	-15.1	-0.6	-3.0	0.0	0.0	-21.0	-1.0	78.0	0.0	0.5
food_18	-65.0	0.0	-1.0	-134.5	-12.4	-1.3	-2.2	0.0	0.0	-10.8	-0.7	65.0	0.0	1.0
food_19	-65.0	0.0	-1.0	-132.5	-11.8	-1.1	-2.3	0.0	0.0	-26.2	-0.8	65.0	0.0	1.0
food_20	-81.0	0.0	-3.3	-68.9	-12.4	-0.6	-1.1	-2.9	-0.1	-6.7	-0.5	81.0	0.0	3.3
Soln	2250.0	300.0	65.0	2400.0	300.0	100.0	100.0	50000.0	20000.0	1600.0	30.0	-2000.0	0.0	0.0
	Serving_5	Serving_6	Serving_7	Serving_8	Serving_9	Serving_10	Serving_11	Serving_12	Serving_13					
food_1	0	0	0	0	0	0	0	0	0					
food_2	0	0	0	0	0	0	0	0	0					
food_3	0	0	0	0	0	0	0	0	0					
food_4	0	0	0	0	0	0	0	0	0					
food_5	-1	0	0	0	0	0	0	0	0					
food_6	0	-1	0	0	0	0	0	0	0					

OUTPUT

> Tableau [Initial & Tableau for each Iteration]

Numerical Analysis Application

POLYNOMIAL REGRESSION

QSI

DIET PROBLEM SOLVER

ABOUT

About

Made by Mapute, A.M.

Final Project for CMSC 150