FOOD CHOICES TO PREDICT GPA

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DATA

College students from Mercyhurst University:

- 126 responses to the survey
  - Picture association, guessing of calories, ranking
- Food choices, nutrition, preferences, eating habits
- Also includes information such as GPA, father & mother education, income
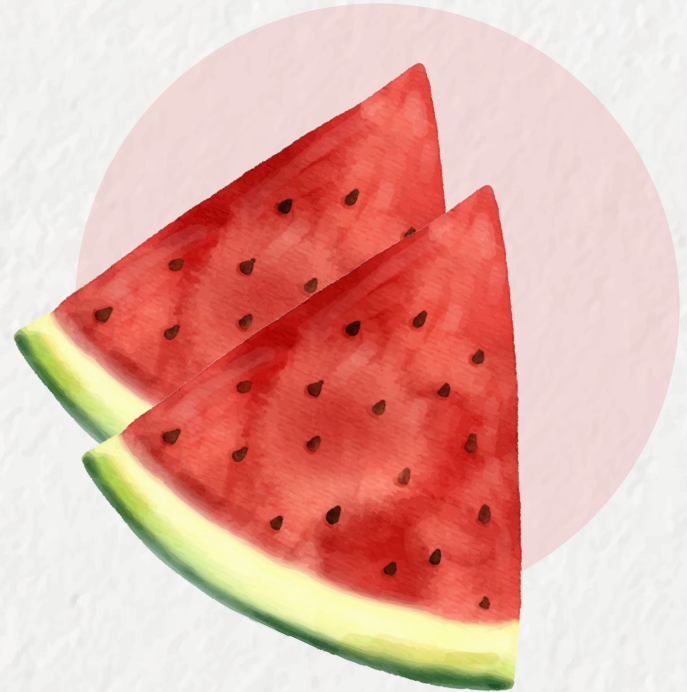
Can food preferences predict GPA?

- Looking at whether food associations and choices have any correlation to how high a student's GPA is

FIRST MODEL VARIABLES

- Breakfast
- Coffee
- Drink
- Fries
- Soup
- Gender
- Father Education
- Mother Education
- Grade Level
- Income
- Weight

SUMMARY: FIRST MODEL

Residual Standard Error

0.6087

Adjusted R Squared

0.2764

p-value

0.0001224

Variables

P-values for individual variables were not all less than alpha at 0.05

STEPWISE REGRESSION

FORWARD & BACKWARD

- Fries
- Soup
- Coffee

- Income
- Grade level
- Father education

FINAL VARIABLES

Y
GPA
GPA of students from Mercyhurst College, based on the standard 4.0 grading scale

X1-6
income
Income was recorded with values from 1-6. Each value represents a range of income, with 1 indicating less than $15,000 and 6 indicating more than $100,000

X7-9
grade_level
Grade level was recorded with values from 1-4, with 1 indicating freshman year and 4 indicating senior year

X10-14
father_education
The father's education level was recorded as a range of values from 1-5, where 1 indicates less than high school and 5 indicates a graduate degree

X15
fries
Students chose between the options of "McDonalds" and "home" for which one they associate with fries

X16
soup
Students chose between the options of "veggie" and "creamy" for which one they associate with soup

X17
coffee
Students chose between the options of "frappuccino" and "espresso" for which one they associate with coffee

SUMMARY: FIRST ORDER

Residual Standard Error

0.6018

Adjusted R Squared

0.2927

p-value

4.179e-6

Interaction Terms?

Tested interaction terms between food variables

FINAL EQUATION:

$$E(y) = 1.34 - 3.40x_1 - 0.16x_2 - 0.13x_3 - 0.35x_4 - 0.36x_5 - 0.27x_6 - 0.37x_7 - 0.01x_8 + 0.10x_9 + 0.32x_{10} + 0.07x_{11}$$
$$+0.37x_{12} + 0.64x_{13} + 0.32x_{14} + 1.68x_{15} + 1.92x_{16} + 0.36x_{17} - 1.54x_{15}x_{16} + 0.09x_{15}x_{17} - 0.42x_{16}x_{17}$$

SUMMARY: INTERACTIONS

Residual Standard Error

0.5735

Adjusted R Squared

0.3576
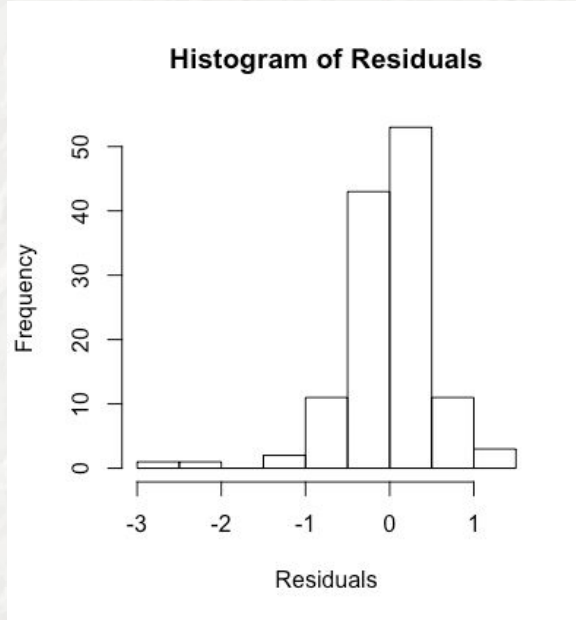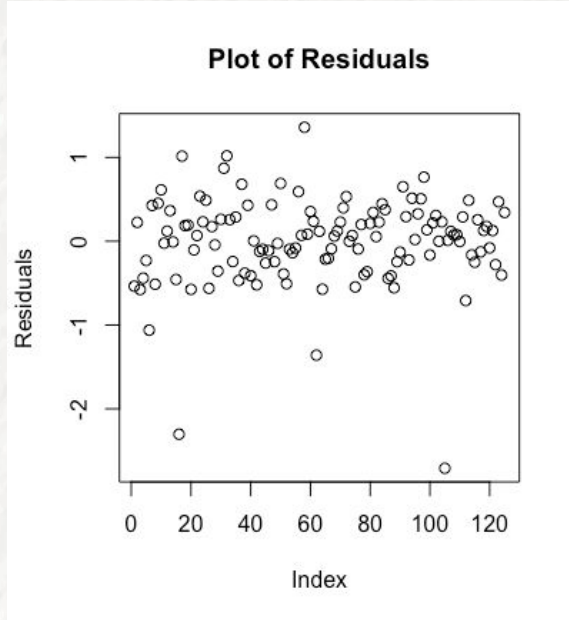
p-value

2.191e-7

Nested Test

Running a nested test resulted in a p-value of 0.0046 meaning the interaction terms were significant
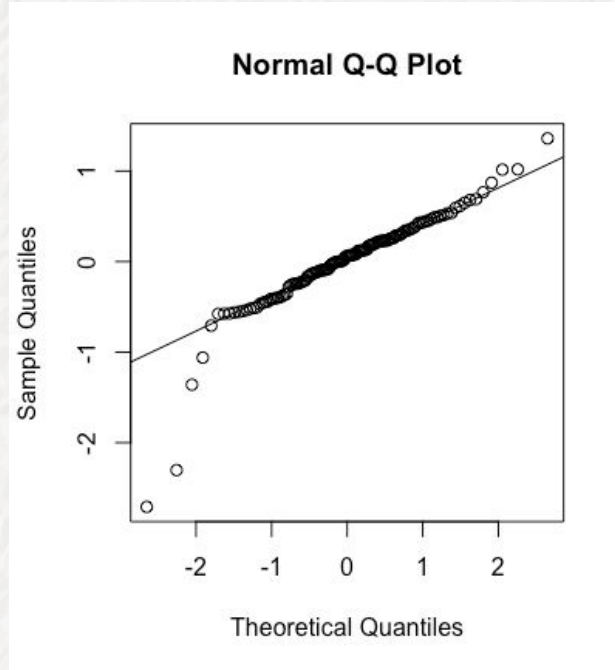
Residual Analysis
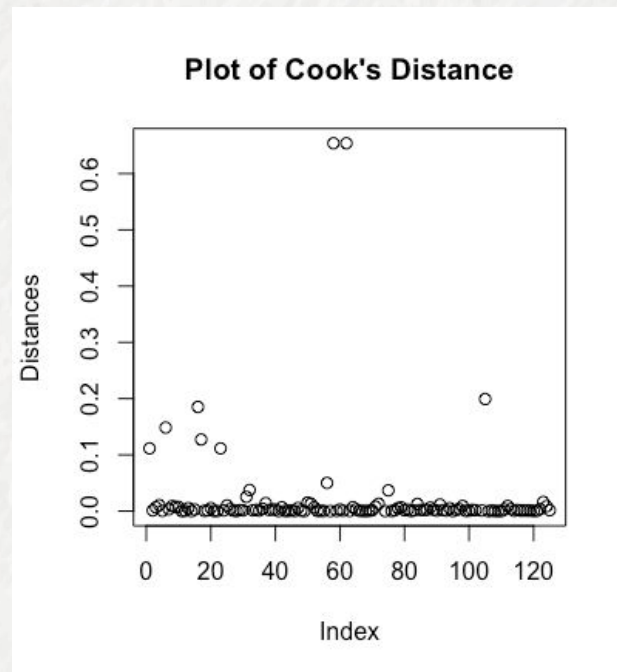
RESIDUAL PLOTS

RESIDUAL PLOTS

OUTLIERS

- Some students filled out the survey incorrectly

  - Put 0 for income when that wasn't an option

  - Put 0 for GPA

  - Put 0 for father education when that wasn't an option

PREDICTIONS WITH OUR OWN CHOICES

ABBY

- COFFEE: espresso → 0
- GRADE LEVEL: junior → 3
- INCOME: less than $15k → 1
- FATHER EDUCATION: college → 4
- SOUP: creamy → 0
- FRIES: McDonalds → 1

PREDICTED GPA: 3.28

LUCIA

- COFFEE: espresso → 0
- GRADE LEVEL: senior → 4
- INCOME: less than $15k → 1
- FATHER EDUCATION: graduate degree → 5
- SOUP: veggie → 1
- FRIES: McDonalds → 1

PREDICTED GPA: 3.25

CONCLUSION

- Model passes the utility test, but the adjusted R^2 value was still very low

  - Most of the variance in GPA values was not explained by our model

- Would want to have a more in-depth survey

  - Include detailed instructions to avoid receiving 0 values (outliers)

- Studying and attending class probably has a bigger impact on GPA than your food preferences