

Targeting Ad Placement On Spoonacular

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Problem

The Facts

- Total U.S. spending on food advertising was \$151 billion dollars in 2018. This was a 4.1% increase from 2017.
- According to the New York Times, a person living in a city today sees over 5,000 ads per day.

Big Question

How can we target successful ad placement in a world where food related ads are everywhere?



Scenario

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- We work as an ads strategy consultant to businesses selling products and services related to the food industry (Williams-Sonoma, KitchenAid, Blue Apron, Hello Fresh, etc...)
- These companies want to place their ads only on webpages that they know people will visit a lot.
- “Likes” is our proxy for web-traffic, without knowing how many people visited the page.

Business Question

Can we predict if a recipe will be "liked" a lot, to understand where to run our ads?



Data

Data Source

- Our data source and target website for advertising is <https://spoonacular.com> - an aggregating website and app for people to collect and store all of their favorite recipes all in one place.

Description

- The Spoonacular Nutrition, Recipe, and Food API allows us to access over 365,000 recipes and 86,000 food products.
 - We obtained the 1000 most popular recipes on Spoonacular.
 - Each recipe provides number of “likes”, calories, prep time, price per serving, full ingredients list, full nutritional breakdown, and confirms if it is compliant with a particular diet.
-

Predictors

Best Predictors For “Liked” Recipes

- Number Of Ingredients
- Prep Time
- Saturated Fat
- Sodium
- Vitamin K
- Fiber

Target

- “Likes”
 - The median for a recipe’s “Likes” is 1300.
 - **If “Likes” > 1300**, then it’s a **winner**.
 - **If “Likes” < 1300**, then it’s a **loser**.

Model Results

Performance

We want to **maximize** the potential to **predict correctly** and make money.

We want to **minimize** the potential to **predict wrong** and waste money.

So, the “**precision**” of our model is the most important metric to consider.

$$\text{Precision} = \frac{\text{Number Of Good Investments}}{\text{Total Number Of Investments}}$$

$$\text{Precision} = 68.1\%$$

Recommendation:

Follow the model to invest in ads!

For every 3 ads, 2 ads will be a good investment and 1 ad may be a loss.



Search spoonacular



Save to Recipe Box

Red Lentil Soup with Chicken and Turnips



- popular
- healthy
- gluten-free
- dairy-free

WILLIAMS
SONOMA
CALIFORNIA



Ad



Ad



Ad

\$2.77 per serving

1,866 likes

Ready in 55 minutes

Spoonacular Score: 99%

Need a **gluten free** and **dairy free** main course? Red Lentil Soup with Chicken and Turnips could be an outstanding recipe to try. For **\$2.8 per serving**, this recipe **covers 37%** of your daily requirements of vitamins and minerals. One serving contains **448 calories**, **23g of protein**, and **20g of fat**. Head to the store and pick up garlic, olive oil, celery stalks, and a few other things to make it today. It is perfect for **Autumn**. From preparation to the plate, this recipe takes about **55 minutes**. Plenty of people made this recipe, and 1866 would say it hit the spot. All things considered, we decided this recipe **deserves a spoonacular score of 99%**. This score is super. Try [Clean Eating Carrot & Ginger Red Lentil Soup](#), [One-Pot Red Lentil Sweet Potato Stew](#), and [Red Lentil and Chicken Soup](#) for similar recipes.

Ingredients

grid list Servings: 8

metric US

- | | | | | | |
|---------------|---------------|---------------------|-------------------------|---------------------------|------------|
| some | 3 medium | 3 | 2 cups | 1/2 cups | 1/4 cloves |
| | | | | | |
| diced avocado | diced carrots | diced celery stalks | shredded chicken breast | Italian flat leaf parsley | garlic |

Save to Recipe Box

Aspic Jelly



gluten-free
dairy-free



\$4.20 per serving

1 likes

Ready in 45 minutes

Spoonacular Score: 41%

Aspic Jelly is a **caveman**, **gluten free**, **dairy free**, and **primal** condiment. This recipe serves 4 and costs \$4.18 per serving. One serving contains **208 calories**, **12g of protein**, and **4g of fat**. Head to the store and pick up onion, carrot, savory, and a few other things to make it today. 1 person has made this recipe and would make it again. From preparation to the plate, this recipe takes roughly **45 minutes**. All things considered, we decided this recipe **deserves a spoonacular score of 44%**. This score is solid. Try [Meat Jelly](#) or [Aspic](#), [Apricot Aspic](#), and [Tomato Aspic](#) for similar recipes.

Ingredients

grid list Servings: 4 metric US

- | | | | | | |
|------------|-------------|-------------|--------------------|--------|----------------|
| 1 bay leaf | some carrot | some celery | 1 sprig dry savory | 3 eggs | 1 box gelatine |
| 1 | ¾ cups | some | 0.02 sprigs | ½ tps | 1 qt |

Improvements

- Obtain web-traffic metrics instead of using “Likes.”
- Pull more data from the Spoonacular database.
- Use Natural Language Processing (NLP) to have better predictors.

Questions?

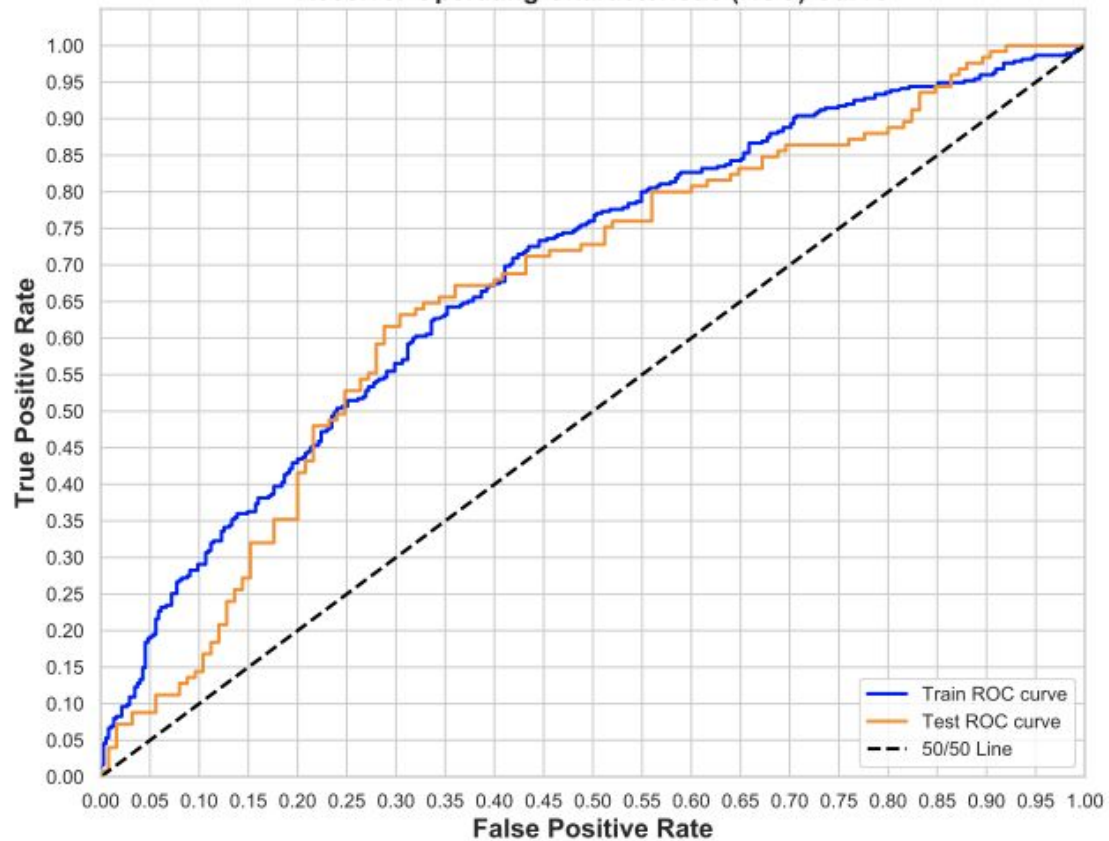
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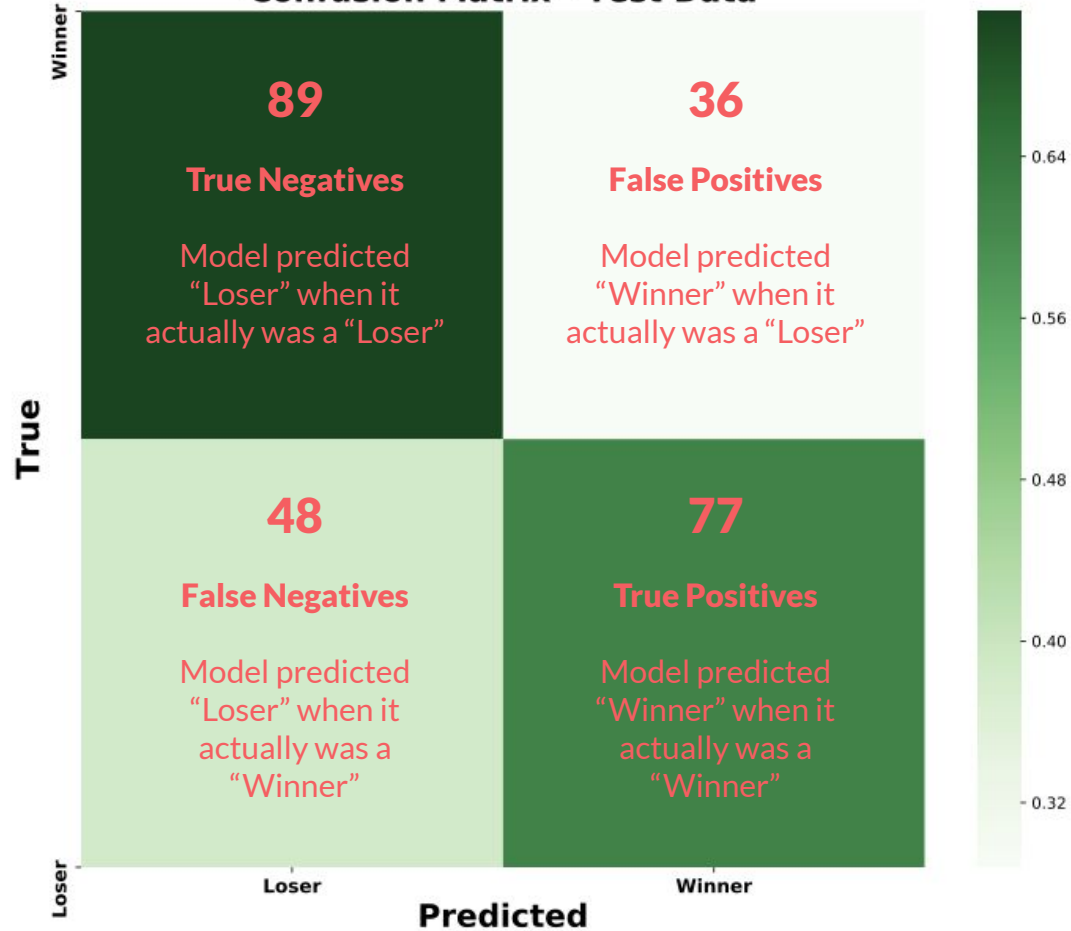
Receiver Operating Characteristic (ROC) Curve



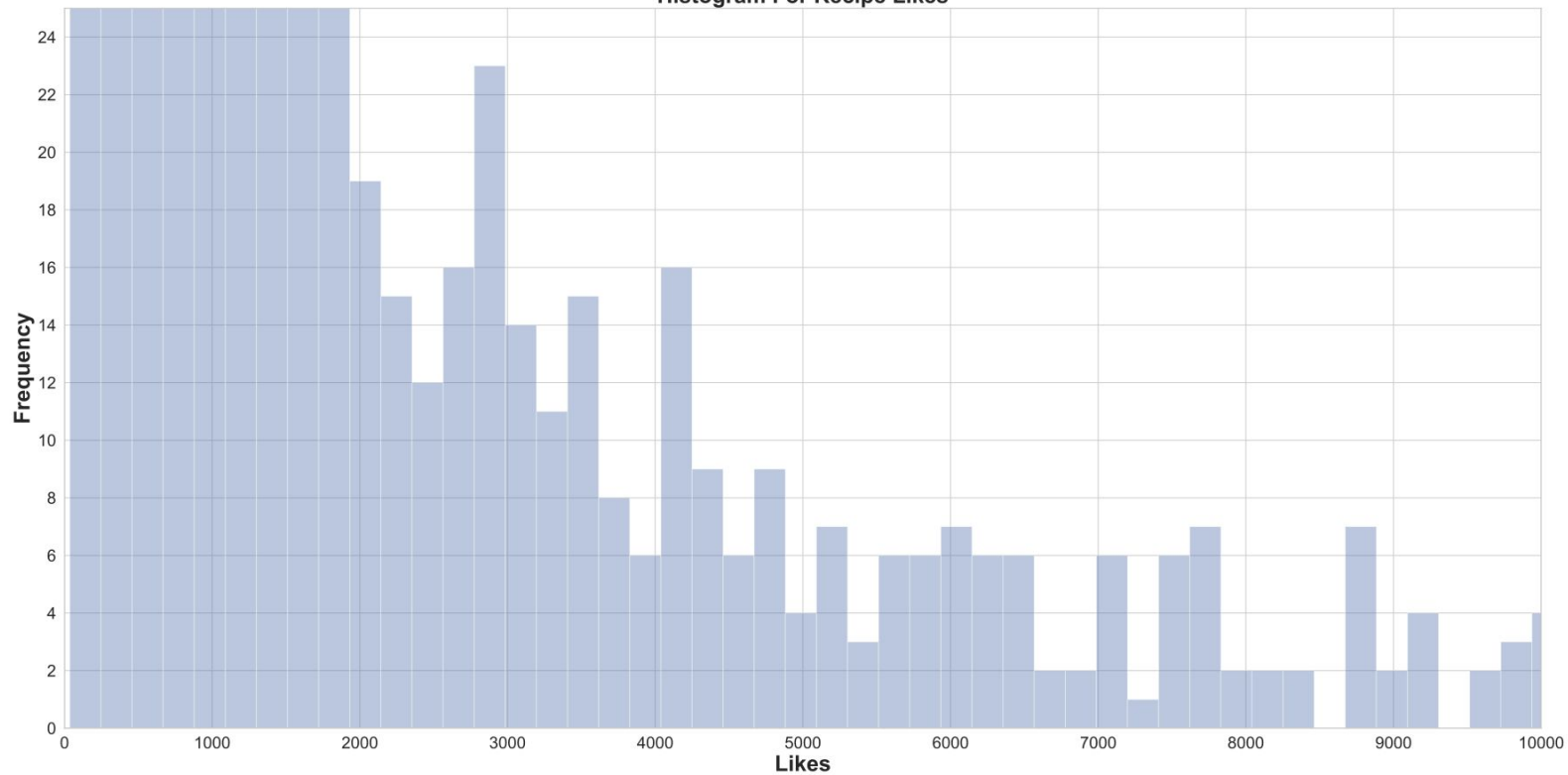
Confusion Matrix - Train Data



Confusion Matrix - Test Data



Histogram For Recipe Likes



Cumulative Density Function For Recipe Likes

