

A Personalized Meal Recommender System

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Feb 20th 2020

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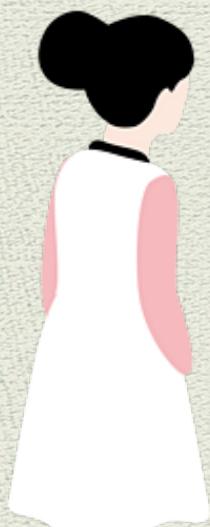


Problem



Help me design a weeknight meal plan.

- ◆ I can only spend totally 💰💰 dollars on 5 meals.
- ◆ ⏳ hours is available for cooking on Monday.



Do you mean.....?

Problem

- ◆ Objective: Maximize Ratings for 5 Meals

- ◆ Constraints:

- Weekly Budget
- Weekly Schedule
- Daily Nutrition Requirement
- Diversity

Model

$$\max \sum_{i=1}^N \sum_{j=1}^5 rating_i x_{i,j}$$

subject to

$$\sum_{i=1}^N price_i x_{i,j} \leq budget, j = 1, \dots, 5$$

$$\sum_{i=1}^N time_i x_{i,j} \leq available_time_j, j = 1, \dots, 5$$

$$\sum_{i=1}^N cal_i x_{i,j} \geq calories_low, j = 1, \dots, 5$$

$$\sum_{i=1}^N nutrient_{i,z} x_{i,j} \geq nutrient_low_z, j = 1, \dots, 5, z = Carbohydrate, Protein, Fat \dots \dots$$

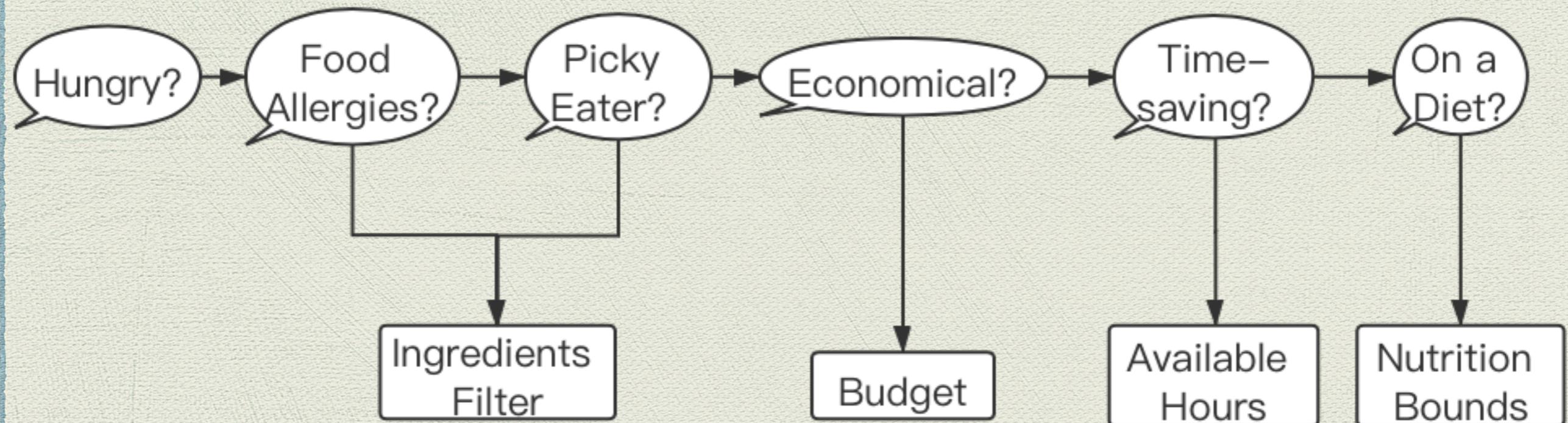
$$\sum_{j=1}^5 x_{i,j} \leq 1, i = 1, \dots, N$$

$$\sum_{i=1}^N \sum_{j=1}^5 x_{i,j} = 5$$

$$x_{i,j} \in \{0,1\}$$

Implementation

1. Determine values of RHSs by interviewing a friend



Implementation

2. Collect and store related recipes data with web scraping

h1.recipe-title.font-bold.h2-text. primary-dark 330.59 x 144

Easy Baked Buffalo Chicken Wings

YUMMY

★★★★★ (22)

Stefanie: "I can taste the baking powder a bit. Could use a..." [Read More](#)

7 Ingredients	60 Minutes	550 Calories
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[Make It Now](#)

9k

The screenshot shows a recipe card for "Easy Baked Buffalo Chicken Wings". The title is at the top in a large blue box. Below it is a "YUMMY" button and a 5-star rating. A testimonial from Stefanie is present. At the bottom are cooking stats: 7 ingredients, 60 minutes, and 550 calories. There are "Make It Now" and "Yum" buttons. To the right is a detailed view of the recipe card with the title "Easy Baked Buffalo Chicken Wings" highlighted. The page includes a search and filter icon, a sidebar with a "Primary" section, and a bottom navigation bar with tabs like Styles, Event Listeners, DOM Breakpoints, Properties, and Accessibility. A red box highlights the "Properties" tab, which shows the CSS for the highlighted element: .recipe-details .recipe-title { margin: 0 0 8px; text-overflow: ellipsis; overflow: hidden; text-shadow: 0 0 0; } and its bounding box dimensions.

Implementation

3. Construct and fill recipes-user-rating matrix

4. Solve by Integer Programming

Thank you

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