Project Proposal: Recipe Finder

What are the names and NetIDs of all your team members? Who is the captain? The captain will have more administrative duties than team members.
- Team: Tastebuddies
    - Vijayaragavan Selvaraj (vs27) - Team Lead
    - Karthika Gopalakrishnan (kg24)
    - Sathyanarayanan Gokarnesan (sg53)

What is your free topic? Please give a detailed description. What is the task? Why is it important or interesting? What is your planned approach? What tools, systems or datasets are involved? What is the expected outcome? How are you going to evaluate your work?
- *Free Topic:* **Recipe Finder**
- *Description:* It is a search tool to find the most popular recipes based on an ingredient. For each recipe in the search result, the users can see the cooking directions, nutritional value and a list of recommended recipes.
- *Task:* We are going to use the novel Information Retrieval techniques to build a web-based search engine that allows users search for the recipes based on their preferred ingredient, and a recommendation service that suggests users a list of similar recipes based on a combination of ingredients and nutritional value.
- *Motivation:* Allrecipes.com is a recipe curation website and has curated over thousands of recipes from all over the world. Our ultimate goal is to develop a Recipe Finder to enhance the recipe search process by retrieving top 20 popular recipes using the ingredient entered by the user and recommend similar recipes for each recipe viewed by the user.
- *Approach:* We are going to use Apache Solr as the backend layer for the search. We will index the data in Solr and fine tune the parameters for better search experience. For the recommender system, we are going to adopt Content-based Filtering mechanism and use the columns, nutritional value and ingredients, to suggest similar recipes to the user.
- *Dataset:* Allrecipes.com dataset from kaggle
- *Outcome:* A website where users would be able to enter an ingredient in a search bar and the system would return the top 20 popular recipes and along with recommendations of similar recipes for each recipe in the top 20 list.
- *Evaluation:* User needs to enter an ingredient (eg. potato) in a search bar and the system would list the top 20 popular recipes for the ingredient. If the users select a recipe from the 20 recipes, they can see the cooking directions and nutrition value for the recipe. In addition to that, the users would also see a list of similar recipes that have similar ingredients and better nutritional value.

Which programming language do you plan to use?
- Python, Apache Solr, Scikits (learn, surprise), Pandas, Numpy, HTML, Javascript, CSS

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Please justify that the workload of your topic is at least 20*N hours, N being the total number of students in your team. You may list the main tasks to be completed, and the estimated time cost for each task.

Our estimate for the project would be 80 hours approximately and below is the breakup of the workload for the project.

- Oct 26 - Nov 9: Import Dataset in Apache Solr (~20 hours)
    - Setup Solr in EC2
    - Data Cleansing & Ingestion
    - Fine Tuning and Performance Analysis
- Nov 10 - Nov 22: Recipe Recommendation Model (~30 hours)
    - Design Content-based Filtering System to recommend similar recipes to the user based on the ingredient and nutritional value
    - Performance Analysis and Fine Tuning of the Model
- Nov 23 - Dec 4: Web Application (~25 hours)
    - Design Backend and Frontend for the Web application
    - Scenario 1:
        - Input: User enters Ingredient in search bar
        - Output: Top 20 recipes that has the ingredient
    - Scenario 2:
        - Input: User opens a recipe from the Top 20 list
        - Output: Cooking Directions, Nutritional Value and Recommendations of similar recipes
- Dec 5 - Dec 8: Documentation & Presentation Preparation (~5 hours)