



# RECIPE GENERATOR

Made For You

APAN 5400 – Project Proposal

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# Background

**1. Nutrition is an essential aspect of our lives, but the process of finding nutritious food can be daunting**

**a. Increasing food allergies**

- i. According to a survey in 2019, 21% of US people are facing food allergies or intolerances
- ii. Food allergy and intolerance products market grows at a CAGR of 5.2% - market size is expected to hit \$32 Billion by 2027
- iii. People with allergies or dietary restrictions are in need of easy ways to make the foods they love

**b. Demands for personalized food and dietary solutions**

- i. 72% of people are interested in changing their current nutritional plans
- ii. Personalized nutrition market size in 2020 is \$8.2 Billion and expected to reach \$16.4 Billion by 2025 (CAGR 15.0%)

**2. Increased home-dining demands post-COVID**

- a. 92% of families plan to continue eating at home
- b. Increasing needs to make the foods they love

**3. We strive to alleviate the inertia and fear of cooking by making it convenient**

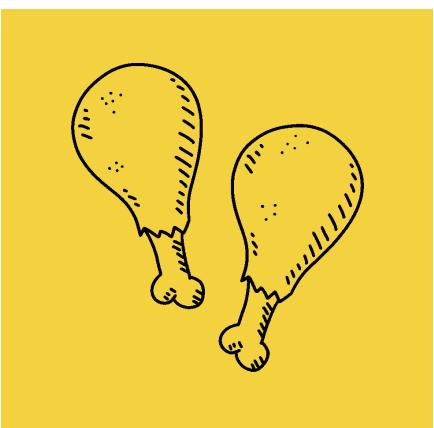
# Definition of Business

Features of our Recipe Generator to meet the above objectives:

- Search for recipes across the web
- Return recipes based on users' hunger pangs (pasta, burgers, etc.) and what they have available in their kitchen
- Further process the data to only recommend recipes that meet the users' dietary restrictions and/or ingredients available



# Data Source



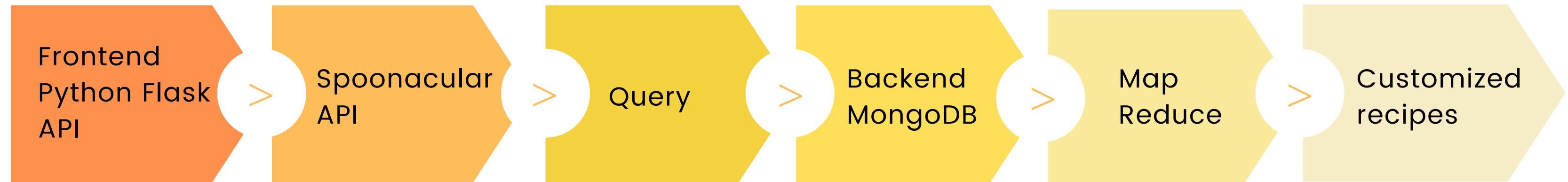
- Recipes will be queried through Spoonacular API:  
(<https://spoonacular.com/food-api>)
- It is a comprehensive database for food information and data with over 2,600+ ingredients, 5,000 recipes, 90K+ products and 115K+ menu items.
- We will register for a free API key that uses a point system as a limitation. If more requests are needed, we can register for a paid plan that suits our requirements
- The queries will be returned in JSON format

## Example Request and Response

```
GET https://api.spoonacular.com/recipes/complexSearch?query=pasta&maxFat=25&number=2
```

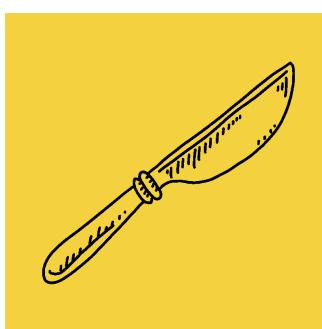
```
{
  "offset": 0,
  "number": 2,
  "results": [
    {
      "id": 716429,
      "title": "Pasta with Garlic, Scallions, Cauliflower & Breadcrumbs",
      "calories": 584,
      "carbs": "84g",
      "fat": "20g",
      "image": "https://spoonacular.com/recipeImages/716429-312x231.jpg",
      "imageType": "jpg",
      "protein": "19g"
    },
    {
      "id": 715538,
      "title": "What to make for dinner tonight?? Bruschetta Style Pork & Pasta",
      "calories": 521,
      "carbs": "69g",
      "fat": "10g",
      "image": "https://spoonacular.com/recipeImages/715538-312x231.jpg",
      "imageType": "jpg",
      "protein": "35g"
    }
  ],
  "totalResults": 86
}
```

# Selected Technologies



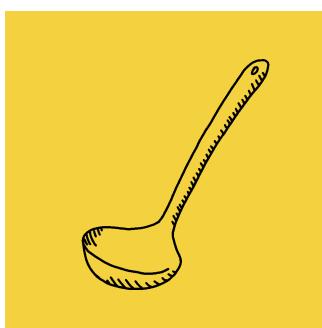
A frontend web application to allow users to type in their searches:

- We will make use of the Python FLASK API for this as it is a swift, lightweight and popular micro-framework for web applications



A database for storing and querying huge amounts of data in the back-end:

- Users might have different parameters in their queries; we require a document-oriented DB that can contain many different key-value pairs in each document
- We also foresee future horizontal scaling. Hence, MongoDB is suitable



A data processing capability to analyze the text data in the recipes to return most relevant results to the user:

- Map-Reduce is able to perform the job

If needed, we can use Elasticsearch for autocomplete features when the user types in his/her requests.



# Data Governance Policies

1. The web form will not use or require the user to key in personal details.
2. Spoonacular always provides credit to the original source of a recipe by including the name of the website/blog along with the hyperlink to the page. We must credit the original source in our web application.
3. Use DB-as-a-service for enhanced data protection

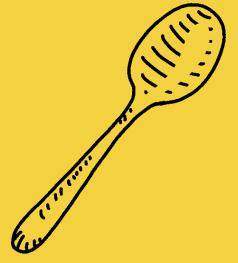
## Costs

- **FLASK API:** No cost
- **MongoDB cloud (DB-as-a-service):** \$57/month
- **Spoonacular API:** No cost for developing PoC. At scale, we require developer access between \$29/month to \$149/month (depends on usage, but use higher cost for budgeting)
- **Man-months for development works:** 1MM (\$5,000)
- **Maintenance of infrastructure:** \$100/month

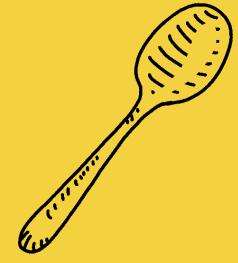
**Non-recurrent expenditure:** \$5,000

**Recurrent expenditure:** \$306/month





# Success Criteria

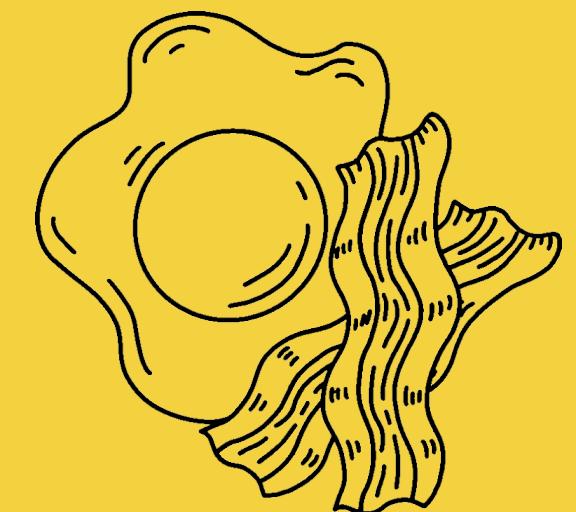


## Quantitative Success Metrics

- TRAFFIC
  - No. of visits to the web application
  - No. of subscribers
- ENGAGEMENT
  - Session length to measure engagement
  - No. of repeat and new users
  - No. of referrals
- SYSTEM PERFORMANCE
  - Speed: Time taken to return recipes to users
  - Availability: API timeouts (Spoonacular API have limited queries a day)
- PROFITABILITY
  - ROI (if we do monetize our app)

## Qualitative Success Metrics

- CUSTOMER SATISFACTION/EXPERIENCE
  - Feedback and reviews on how they like/dislike the web application
    - Including application rating
  - Was the web application easy to use (UI/UX)?
- RELEVANCE
  - How relevant are the recipes to the users' expectations?
  - Accuracy of the searches



# References

- Food Allergies & Intolerances in the United States 2019. (n.d.). Statista. Retrieved October 25, 2021, from <https://www-statista-com.ezproxy.cul.columbia.edu/forecasts/1093511/food-allergies-and-or-food-intolerances-in-the-us>
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