Allergy App

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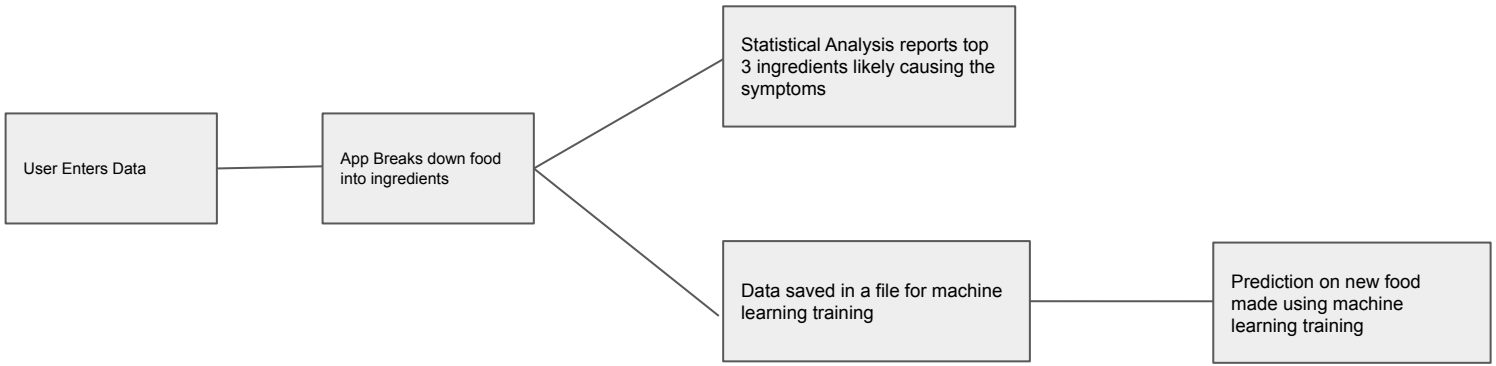
Features of the app for the user

- User enters food they ate and allergic symptoms felt while eating
- App stores data in database
- App breaks food down into ingredients
- Over time, app analyzes trends and figures out what ingredients are potentially causing the allergic symptoms.
- The user can enter a food item, and the app will predict their chance of being allergic to it

Flowchart

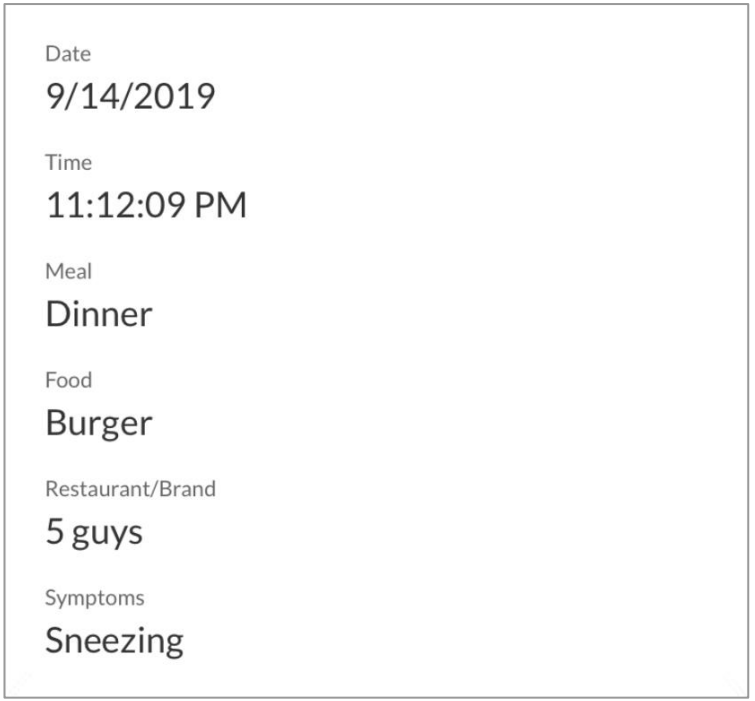

User Enters Data
App Breaks down food into ingredients
Statistical Analysis reports top 3 ingredients likely causing the symptoms
Data saved in a file for machine learning training
Prediction on new food made using machine learning training

Problem Statement

- Most nutrition apps focus on weight loss
- Useful information to have when consulting a doctor about potential allergies.
- Allergy tests are targeted, so it will be helpful to the doctor so they know what to test for
- Users can quickly get a prediction on if they are allergic to a food, which can come in handy if they are at a gathering
- Chose this problem because of serious allergies in the family

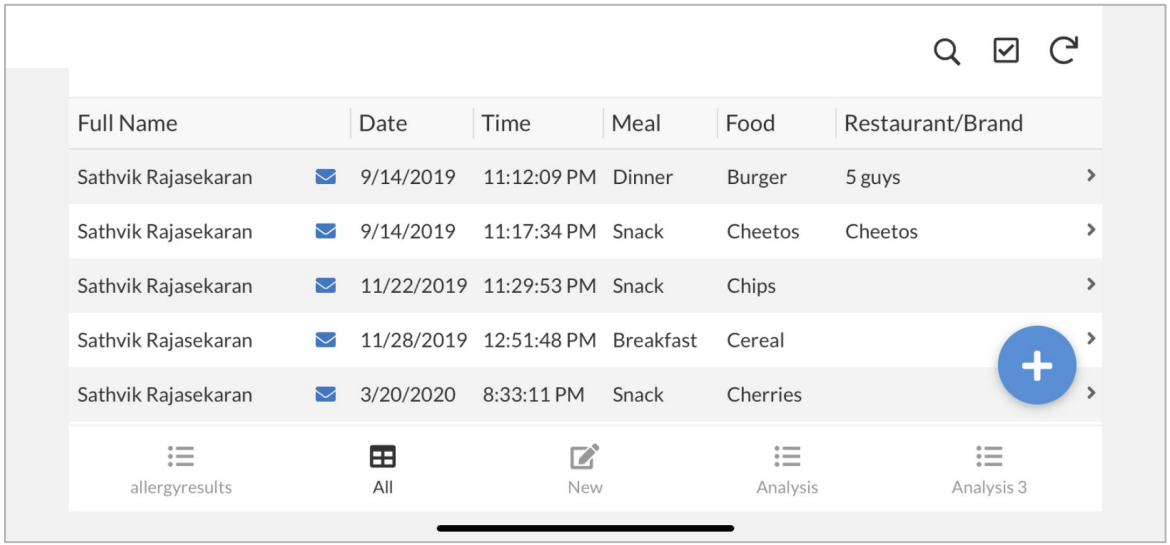
App Images

This is a sample entry entered by the user, if they had allergic symptoms for a particular meal



App Images

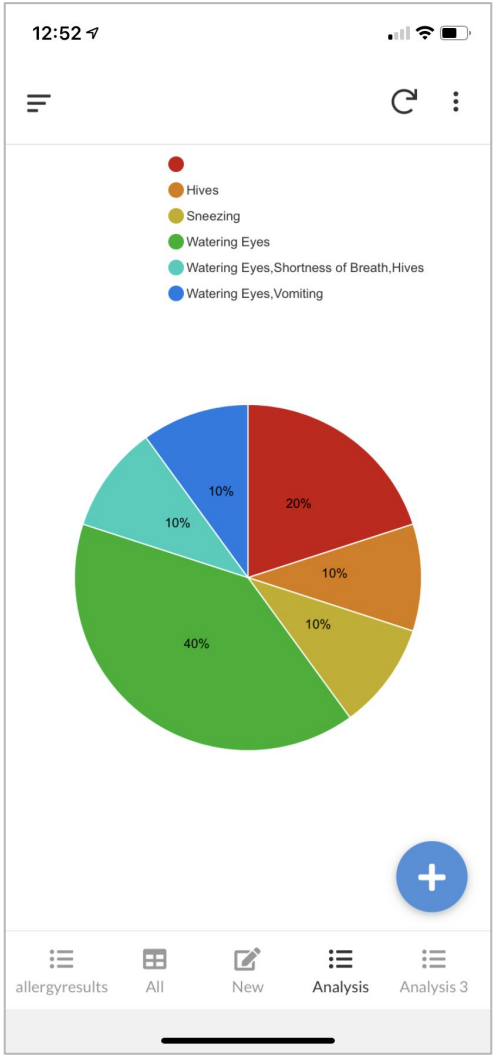
Here, the user can see a log of all of their past entries to look back on and show their doctor for follow-up.



App Images

This is one of the forms of statistical analysis performed on the data entered by the user, creating a distribution of their symptoms.

Distribution of symptoms for a user



How Does it Work

The app provides the user with 3 possible ingredients that it thinks the user likely has an allergy to using statistical analysis.

How does it work (continued)

The program also uses a logistic regression algorithm to predict the chance that the user will be allergic to a given food, based on their past entries

In [ ]:

```
from sklearn.feature_extraction.text import CountVectorizer
import tensorflow as tf
bow = CountVectorizer(min_df=0, lowercase=False)
bow.fit(X_train)
print(bow.vocabulary_)
X_train = bow.transform(X_train).toarray()
print(X_train)
X_test = bow.transform(X_test).toarray()
print(y_train)
```

In [ ]:

```
import tensorflow as tf
from tensorflow.keras.models import Sequential
from tensorflow.keras.layers import Dense, Activation,Dropout, Flatten
from sklearn.linear_model import LogisticRegression
y_train = y_train.astype('int')
y_test = y_test.astype('int')
classifier = LogisticRegression()
classifier.fit(X_train, y_train)
score = classifier.score(X_test, y_test)
print(score)
```

Skill Sets and Technologies Used

- Machine Learning
- App Development
- Working with Databases
- Working with CSV files
- Weka https://www.cs.waikato.ac.nz/ml/weka/
- Kaggle Notebooks https://www.kaggle.com/
- Appsheet https://www.appsheet.com/
- Coursera (Stanford Machine Learning Course) https://www.coursera.org/learn/machine-learning
- Java and Python

Next Steps

- Implement ways for users to more conveniently get predictions on if they will be allergic to a specific food (e.g. asking through Siri or Google assistant)
- Compare trends across individuals in the same region to identify possible food contamination in the area.
- Expand database to cover more ingredients
- Given the analysis of user allergy history, if the user selects a restaurant, the app can highlight all items in the menu that could cause potential allergies