

1. Preliminary research
2. Meeting w ramana
3. Determine factors to analyze APIs
  - a. Functionality
  - b. Cost
  - c. Ease of API integration
  - d. Documentation available
  - e. Customer support
  - f. Customer base
  - g. Potential network effect
4. Decide API(s) based on determined factors
5. Plan implementation
  - a. Assumptions
  - b. Technical
6. Presentation of findings

Objectives to keep in mind when evaluating APIs (from project writeup)

- Identifying the type of food (class)
- Predicting food groups present in the image
- Predicting portion size of the meal
- Take qualified dietitian user feedback to augment the portion prediction by each food group in a meal

Google Cloud Vision

- <https://medium.com/@richellechua/food-vision-calorie-intake-tracker-using-google-vision-api-and-firebase-a16c086ec882>
  - School project from someone, github link is included
- <https://linuxtut.com/en/a679ea45053ba6395b38/>
  - Very basic step by step
- <https://terencelucasyap.com/build-food-classifier-app-google-cloud-vision/>
- Quick setup tutorial: <https://cloud.google.com/vision/docs/setup>

Article comparing 3 diff APIs for which is most effective specifically for food recognition

- <https://bytes.grubhub.com/https-medium-com-rohan-kulkarni-comparison-of-image-recognition-apis-on-food-images-cddc9105fc33>
  - AWS more cost effective
  - Google more granularized tags and culturally based suggestions (eg. Indian cuisine, PadThai)
- <https://www.altexsoft.com/blog/image-recognition-apis/>

Calorie Mama sample projects (Android App)

- [https://github.com/azumio/see\\_food\\_recognition\\_with\\_calorie\\_mama](https://github.com/azumio/see_food_recognition_with_calorie_mama) (not python but in java)

## Amazon AWS

- Image classification tutorial:  
<https://docs.aws.amazon.com/rekognition/latest/customlabels-dg/tutorial-classification.html> (basic steps to start the project)
- Basics of Test&Train Dataset and Model in AWS:  
<https://docs.aws.amazon.com/rekognition/latest/customlabels-dg/tutorial-classification.html>
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## Other API options specifically tailored for food

- <https://www.logmeal.es>
- <https://www.clarifai.com/models/ai-food-recognition>
- <https://www.ibm.com/blogs/cloud-archive/2017/05/watson-learns-see-food-introducing-watson-visual-recognition-food-model/>
- <https://spoonacular.com/food-api> (contains recipe analysis too)
- <https://www.edamam.com/>

## Food Portion related article & website

- <https://towardsdatascience.com/predicting-food-serving-sizes-with-a-feed-forward-neural-network-2d8d40d82f72>
- <https://calorieninjas.com/> → analyze the portion of nutritions in each food
- <https://rapidapi.com/chomp/api/chomp-food-nutrition-database-v2>
- <https://www.fitterfly.com/nutrition-database-apis> (nutrition dataset by food)
- [https://platform.fatsecret.com/api/?gclid=Cj0KCQjw-JyUBhCuARIsANUqQ\\_I\\_8LaZj2ZnGiUQGpzba92Px25BWNBlaNp2aPIxI\\_qpo\\_dxvA5FvUaAr24EALw\\_wcB](https://platform.fatsecret.com/api/?gclid=Cj0KCQjw-JyUBhCuARIsANUqQ_I_8LaZj2ZnGiUQGpzba92Px25BWNBlaNp2aPIxI_qpo_dxvA5FvUaAr24EALw_wcB)
- <https://ieeexplore.ieee.org/document/4649292/figures#figures>

Main Problem: How are we going to combine vision APIs for food detection with proportion analysis?

- <https://datanutrition.org/> → a lot of sample researches & steps for generating nutrition label
- <https://fdc.nal.usda.gov/api-guide.html>

Example procedure:

- Select API and extract food type from image
- Using food type, use database (I think phrql has this) to pull ingredients, which is linked to food groups (see food groups spreadsheet that was shared w us)
- Predict portion using a method similar to portion links above?
- Portion by food group

	Google (Label Detection)	Amazon Rekognition (Label Detection)	IBM	Calorie Mama	Clarifai (AI food recognition)
Cost	<b>Free</b> upto 1000, <b>\$1.50</b> for 1001 - 5M / month	<b>Free</b> up to 5,000 images per month for 12 months <b>\$0.001</b> per image for 0-1M, <b>\$0.0008</b> for next 4M, <b>\$0.0006</b> for next 30M	Free upto 1000/month,  Need to access portal for more information (billing address needed)	Trial Plan: \$100 → 1000 server cells & full nutrition info  20k Plan: \$2,000 → 20000 server cells & full nutrition info	Community - free upto 1k  Essential - \$30  Professional - \$300  Enterprise - Unlimited
Customer support	FAQs, active community on stack overflow (official support for a cost)  Business hours  Standard plan: <b>\$29</b> per month + 3% net spending	FAQs, Documentation 24/7  Developer plan: <b>\$29</b> per month + 3% net spending	Need to access portal for more information (billing address needed)	Contact us	Claribot → able to ask general questions
Customer base (inferred, unable to find concrete data on this)	Popular for all kinds of image classification ranging from big businesses to personal projects	Popular for all kinds of image classification ranging from big businesses to personal projects	Popular for all kinds of image classification ranging from big businesses to personal projects	Frequently used by other diet/food tracker applications for food classification	Customer base includes major grocery retailers and other businesses looking for specific food and ingredient classification
Documentation available	<a href="#">Guide on Google cloud platform</a>	<a href="#">Tutorial for setup and testing case</a>	Need to access portal for more information (billing	<a href="#">Example code</a>	<a href="#">Detailed guide on setup and general issues</a>

			address needed)		
Compatibility with needs/ease of Integration	Sometimes it shows the meal name, sometimes it doesn't. It states a few ingredients.  Will likely require tweaking/mo difications.  Many resources and guides online	Sometimes it shows the meal name, sometimes it doesn't. It states a few ingredients.  Will likely require tweaking/mo difications.	Built-in model specifically for food and gives large amount of flexibility in creating custom classifiers to build a more accurate model for our needs	States the Food name first, and shows the ingredients & calorie for each food	Mostly classifies as ingredient names, may need to cross reference meal/recipe databases to be effective
Functionality (no project specific tests performed yet)	<a href="#">Demo for cloud vision api</a>	<a href="#">Detecting Labels</a>	<a href="#">Usage of watson visual recognition → e.g. in location</a>	<a href="#">Demo for food classification</a>	<a href="#">Sample images using clarifai</a>

Picture 1



Picture 2



Picture 3



**Google vision API**



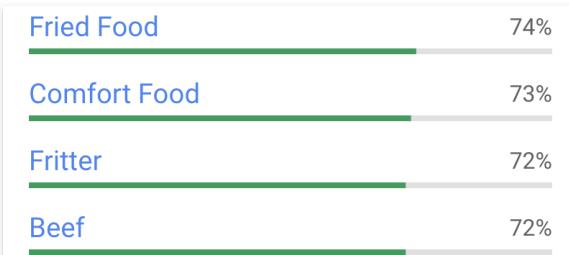
9AB28997-4B6F-4614-8654-347D96890CBD.jpeg

Food	98%
Corn	97%
Corn On The Cob	94%
Sweet Corn	94%
Corn Kernels	91%
Hot Dog Bun	90%
Ingredient	90%
Sandwich	88%



A29F8C2E-FC5F-4D89-A0CD-726AB35891C6.jpeg

Food	98%
Tableware	91%
Ingredient	89%
Dishware	88%
Recipe	88%
Cuisine	85%
Dish	83%
Plate	81%
Staple Food	81%
Beef	80%



Clarifai

salmon	1.00
smoked salmon	0.93
avocado	0.90
salad	0.88
grilled salmon	0.85
sandwich	0.98
pork	0.97
slaw	0.97
corn	0.92
coleslaw	0.92
bread	0.90

steak	1.00
barbecue	0.95
beef	0.93
sirloin	0.86
meat	0.85
pepper	0.82

## Amazon

Need to detect specific objects and scenes unique to your business? Use Rekognition Custom Labels [to quickly build a custom model, no machine learning experience required.](#)



Search all labels [Download full list](#)

Check whether we support your label  Enter a label name

▼ Results

Dish	98.7 %
Meal	98.7 %
Food	98.7 %
Plant	78.8 %
Platter	76.6 %
Meat Loaf	73.7 %
Steak	71.5 %

Show less



Choose a sample image  

Use your own image  
Image must be .jpeg or .png format and no larger than 5MB. Your image isn't stored.  
 Upload or drag and drop  
 Use image URL  Go

▼ Results

Lunch	94 %
Food	94 %
Meal	94 %
Dish	84.3 %
Steak	83.4 %
Plant	64.6 %
Egg	60.9 %
Platter	57.7 %
Vase	55.2 %
Pottery	55.2 %
Jar	55.2 %

Show less

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or drag and drop

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Go

## Search all labels

Download full list

Check whether we support your label

Enter a label name

## ▼ Results

Hot Dog	97.9 %
Food	97.9 %
Meal	68.5 %
Lunch	56.5 %

## ► Request

## ► Response