# What Am I Eating?

- Users who want to take care of their diets due to any disease or their preferences can use this application.
- After entering the application, users select the ingredients they want to eat or do not want eat
- When users go to a restaurant; by taking a picture of the menu, they can see whether or not the meals in the menu match their preferences.

# Method Followed

- Creating dataset
- Creating documents and indexing meals by using Lucene Library.
- Getting meal names on the menu by using Google Cloud Vision API
- Sending the meal names along with user preferences to Lucene web service
- Providing recommendations to the user according to the information provided by the web service

# Steps (1) – Creating Dataset

- Taken recipes with software scripts from various web sites.
- However, these recipes contained rather unnecessary words. They had to be cleaned. For this purpose stopwords were created and used.

```
----------> 700 gram dana kıyma
dana kıyma
----------> 300 gram kuzu kıyma
kuzu kıyma
----------> 1 diş sarımsak
sarımsak
----------> 2 adet kuru soğan
soğan
----------> 1 çay kaşığı pul biber
pul biber
----------> 1 çay kaşığı karabiber
karabiber
----------> 1 yemek kaşığı acı biber salçası
biber salçası
```

```
----------> 2 dilim büyük boy fileto levrek balığı
levrek
----------> 1/2 adet küçük boy kırmızı soğan
soğan
----------> 4 adet cherry domates
domates
----------> 1 yemek kaşığı kapari turşusu
kapari turşusu
----------> 2 yemek kaşığı dilimlenmiş siyah zeytin
siyah zeytin
----------> 2 yemek kaşığı zeytinyağı
zeytinyağı
----------> 1 dal taze biberiye
biberiye
```

# Steps (2) – Indexing Meals With Lucene Library

- We indexed ingredients of meals, which are taken with software scripts from web site and cleaned with stopwords, with Lucene Library.

```
String[] meals={"Tas Kebabı","Soğan Halkası","Soğan Kebabı","Sinop Mantısı","Mac and Cheese","Macar Kebap","Makarna Cipsi","Makarna Salatası","Mantarlı Pilav"};
String[] shouldIngredients={"maydanoz","domates","nane"};
String[] mustNotIngredients={"sarımsak","soğan"};
recommended meals
Total Results :: 4
Meal : Makarna Salatası, Score : 10.15268 id: 1043
sebzeli makarna,konserve garnitür,kornişon turşu,dereotu,yoğurt,mayonez,zeytinyağı,nane,tuz
--------------------------
Meal : Mantarlı Pilav, Score : 9.353283 id: 1069
pirinç,tereyağı,tavuk,mantar,fıstık,tuz,maydanoz
--------------------------
Meal : Mac and Cheese, Score : 7.1071525 id: 1033
pipette,tereyağı,un,süt,hardal,yumurta,cheddar peyniri,parmesan peyniri,tuz,karabiber
--------------------------
Meal : Makarna Cipsi, Score : 7.1071525 id: 1041
farfalle makarna,mısır unu,parmesan,biber,karabiber
--------------------------
unrecommended meals
Total Results :: 5
Meal : Tas Kebabı, Score : 9.653368 id: 1622
dana eti,ayçiçek,tereyağı,soğan,sarımsak,un,havuç,patates,domates salçası,tuz,karabiber
--------------------------
Meal : Sinop Mantısı, Score : 8.405644 id: 1498
un,yumurta,tuz,un,kıyma,soğan,doğranmış maydanoz,salça,tuz,karabiber,zeytinyağı,soğan,zeytinyağı,tereyağı,biber,tuz,ceviz
--------------------------
Meal : Soğan Kebabı, Score : 8.396542 id: 1517
kıyma,tuz,soğan,biber salçası,karabiber,pul biber,nar ekşisi
--------------------------
Meal : Macar Kebap, Score : 8.251255 id: 1034
dana eti,bezelye,patates,karabiber,mısır,patlıcan,zeytinyağı,kaşar peyniri,karabiber,tuz,sarımsak,domates,tereyağı,un,süt,tuz,karabiber,muskat cevizi
--------------------------
Meal : Soğan Halkası, Score : 8.192635 id: 1516
soğan,yumurta,süt,un,mısır nişastası,kabartma tozu karbonat,tuz,karabiber,biber,ekmek galeta unu,ayçiçek
--------------------------
time to search over index: 835ms
```

# Steps (3) – Taking Texts From Photos

- This is an basic optical character recognition process.
- Various image processing techniques (noise removing, grayscaling, resizing, deskewing and border removal) were applied to the photos in order to recognize Turkish characters.

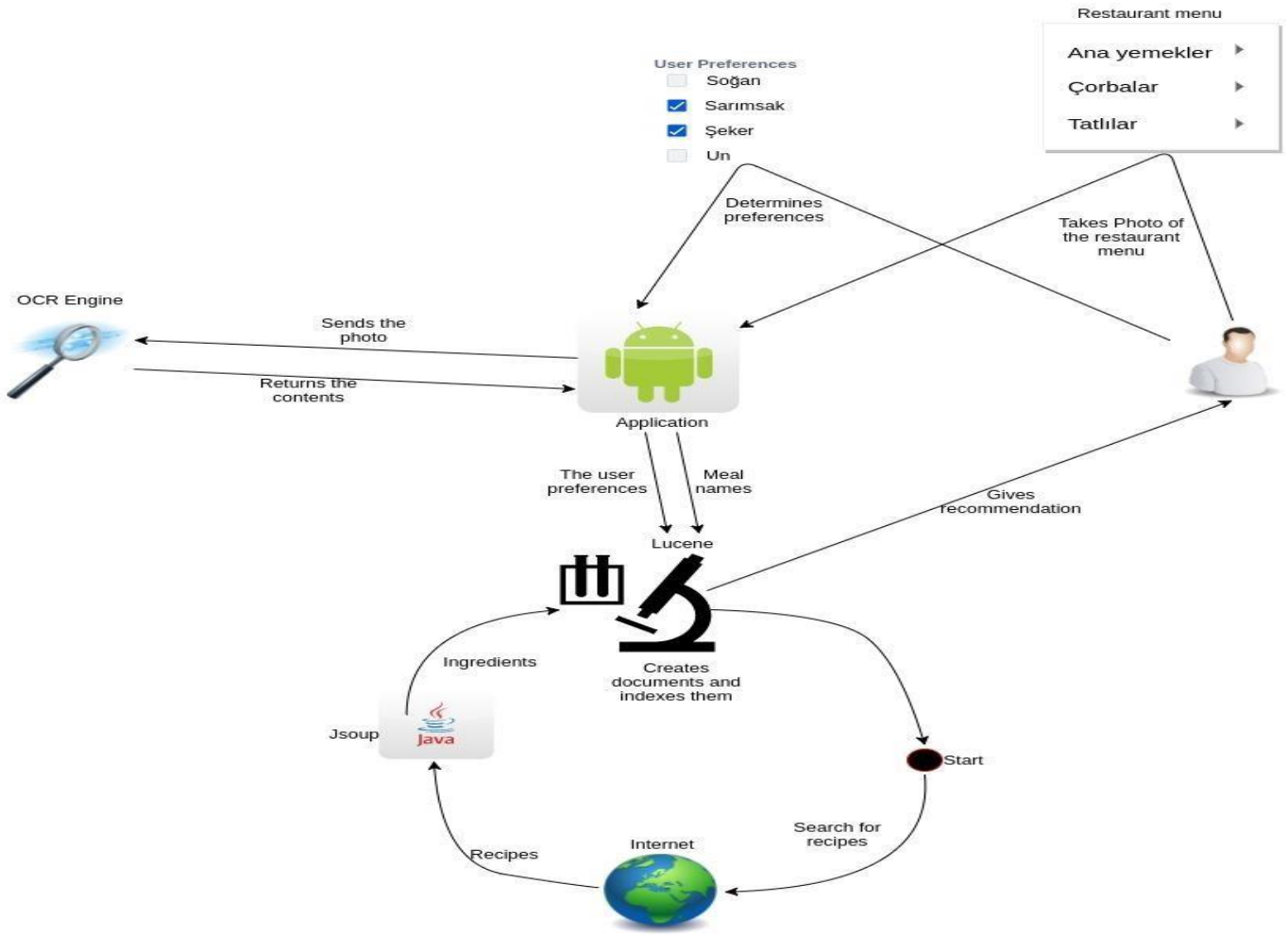
| HER GÜNE ÖZEL SULU YEMEK ÇEŞİTLERİ | | ÇORBA ÇEŞİTLERİ | |
|---|---|---|---|
| Sebzeli Kebap | 6.50₺ | İşkembe Çorbası | 5.00₺ |
| Orman Kebabı | 6.50₺ | Kellepaça | 6.00₺ |
| Biber Dolma | 6.50₺ | Ezogelin Çorbası | 3.00₺ |
| Taze Fasulye | 6.00₺ | Mercimek Çorbası | 3.00₺ |
| Yaz Türlüsü | 6.00₺ | Tavuk Suyu Çorbası | 3.00₺ |
| İzmir Köfte | 6.50₺ | PİLAV ÇEŞİTLERİ | |
| Fırın Köfte | 6.50₺ | Pirinç Pilavı | 3.00₺ |
| Sebzeli Köfte | 6.50₺ | Bulgur Pilavı | 3.00₺ |
| İslim Köfte | 6.50₺ | Arnavut Ciğeri | 7.00₺ |
| Hasanpaşa Köfte | 6.50₺ | Adınbudu Köfte | 6.50₺ |
| Ekşili Köfte | 6.50₺ | Izgara Köfte | 7.50₺ |
| Kuru Fasulye | 5.00₺ | | |

```
HER GÜNE ÖZEL
ÇORBA ÇEŞİTLERİ
SULU YEMEK ÇEŞİTLERİ
Sebzeli Kebap
İşkembe Çorbası
Orman Kebabı
Kellepaça
Biber Dolma
Ezogelin Çorbası
Taze Fasulye
Mercimek Çorbası
Yaz Türlüsü
Tavuk Suyu Çorbası
İzmir Köfte
Fırın Köfte
Sebzeli Köfte
Pirinç Pilavı
İslim Köfte
Bulgur Pilavı
Hasanpaşa Köfte
Arnavut Ciğeri
Adınbudu Köfte
Ekşili Köfte
Kuru Fasulye
Izgara Köfte
```

# Steps (4) – Matching Meals With Ingredients

- Meals indexed with the Lucene library; are exist on a RESTFUL Web service.
- Texts, which are received with OCR, from photos taken on the Android platform; sended to this web service.

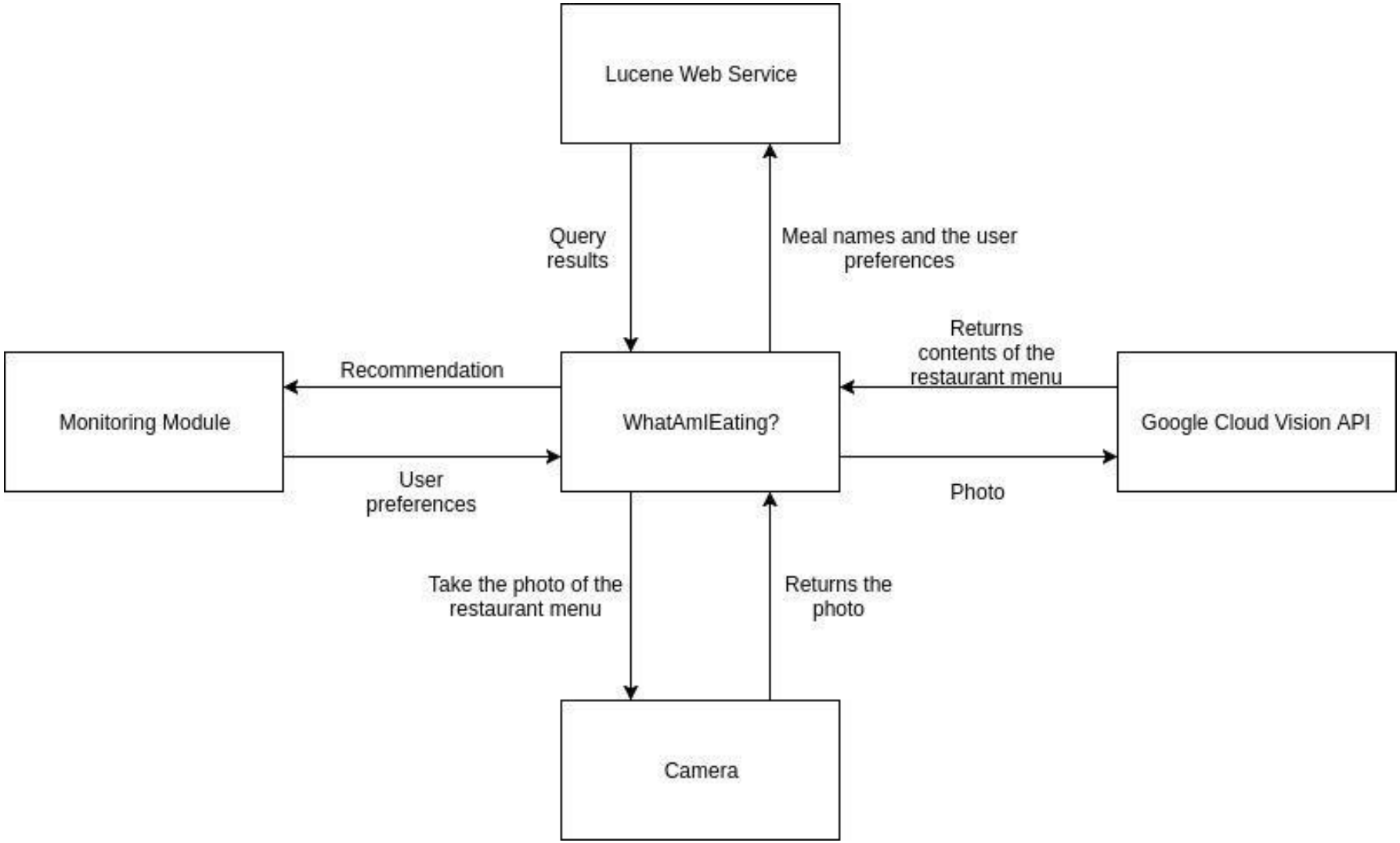
# Project Overview



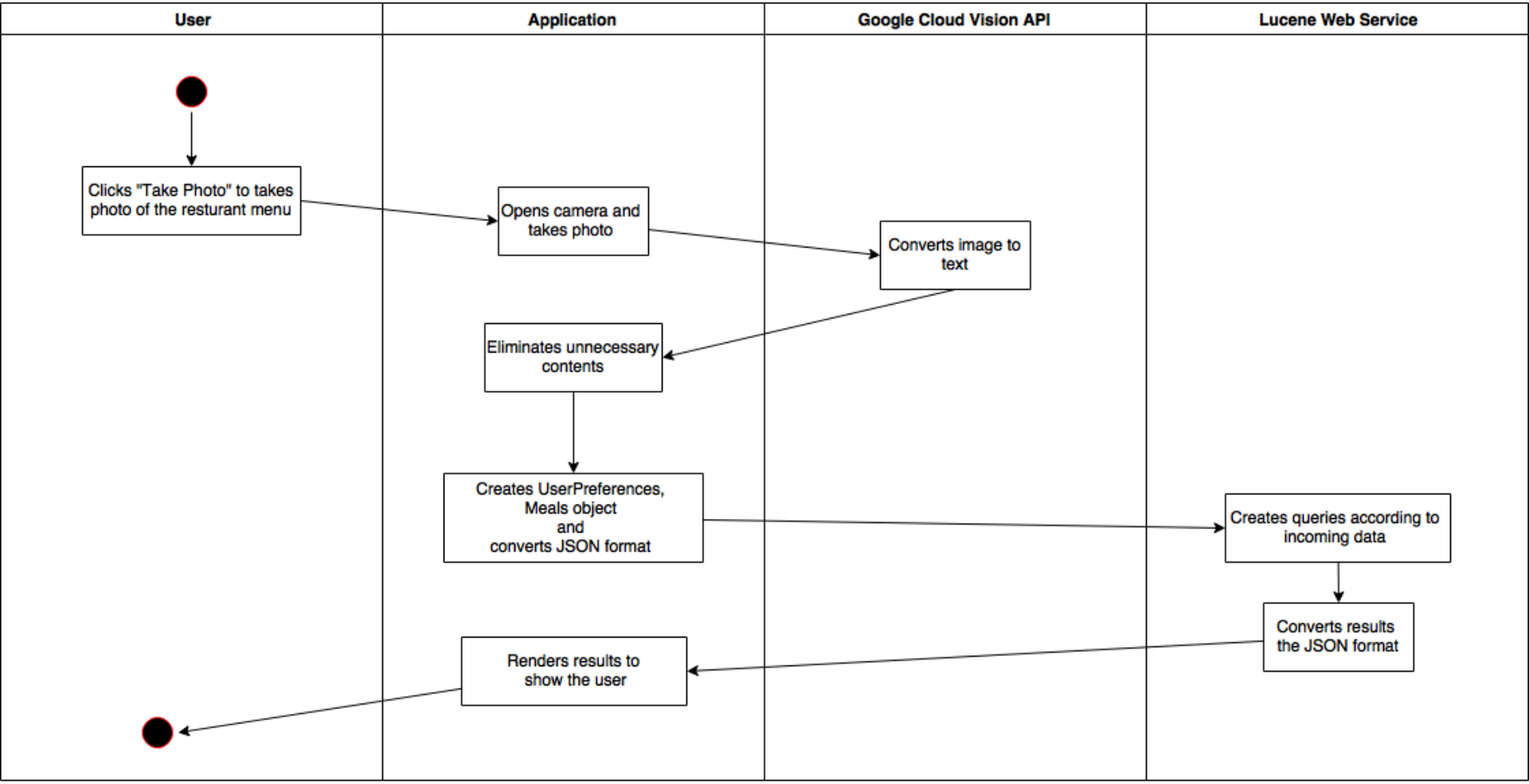
# Background

- Used Google Cloud Vision API as OCR engine
- Used Lucene as information retrieval library
- Implemented a RESTful web service by using JAX-RS API

# Technical Design



# Operational Scenarios



# Evaluation of Results

Unwanted Ingredients;


Restaurant menu;

| | |
|---|---|
| • TASKEBAP | 9.00 TL |
| • DANA TUZLAMA | 9.00 TL |
| • FIRIN KEBAP | 7.50 TL |
| • ORMAN KEBAP | 7.50 TL |
| • DOMATES KEBAP | 7.50 TL |
| • SEBZELİ KEBAP | 7.50 TL |
| • PATLICAN KEBAP | 7.50 TL |
| • ET SOTE | 7.50 TL |
| • ÇOBAN KAVURMA | 8.00 TL |
| • SAÇ KAVURMA | 7.50 TL |
| • ELBASAN TAVA | 6.00 TL |
| • BOSTAN KEBAP | 7.00 TL |
| • HÜNKAR BEĞENDİ | 7.00 TL |
| • İSLİM KEBAP | 7.00 TL |
| • BEZELYELİ KEBAP | 6.00 TL |
| • ET YAHNİ | 7.00 TL |
| • ALİ NAZİK | 7.00 TL |
| • ETLİ GÜVEÇ | 7.00 TL |
| • ET HAŞLAMA | 8.00 TL |
| • KANARYA KEBAP | 7.00 TL |
| • SARAY KATMER | 7.00 TL |
| • ARNAVUT CİĞERİ | 6.50 TL |
| • KAŞARLI CİĞER | 7.00 TL |

Results;


Details;

# Contributions to Industry and Economy

It is aimed to contribute to the healthy nutrition of the users with this application. In this respect, it is aimed to decrease health problems caused by nutrition of the users and to decrease the health expenditures made by this reason.

# References

[1] https://cloud.google.com/vision/

[2] https://lucene.apache.org/core/7_0_1/core/overview-summary.html [3]

https://jsoup.org/apidocs/overview-summary.html/

[4] https://en.wikipedia.org/wiki/Optical_character_recognition

[5] https://play.google.com/store/apps/details?id=com.fooducate.nutritionapp&hl=en

[6] https://itunes.apple.com/us/app/substitutions/id372387251

[7] https://play.google.com/store/apps/details?id=com.shopwell.shopwellandroid