Slido.com - #3927048

Integrate AI into Your Website

Agenda

2.00-2.05pm	Recap for Workshop 3
2.05-2.45pm	Introducing Cloud Storage
2.45-2.50pm	Break + Q&A
2.50-3.30pm	Introducing Cloud Vision API
3.30-3.35pm	Break + Q&A
3.35-4.15pm	Introducing JSON File
4.15-4.20pm	Quiz
4.20-4.30pm	Q&A + Sneak Peeks

```
function filterStudies({ studies, filterByOrg = false, filte
              studies.filter(study => {
                  organizat
```

Course Page

https://gcpe2023.github.io/Day04/

Event Page

https://bit.ly/GCPEDay04

Google Developer Student Clubs

1.0 Recap for Workshop 3

Google Developer Student Clubs

Recap for Workshop 3

01 Introduction to API

02 Introduction to Node.JS

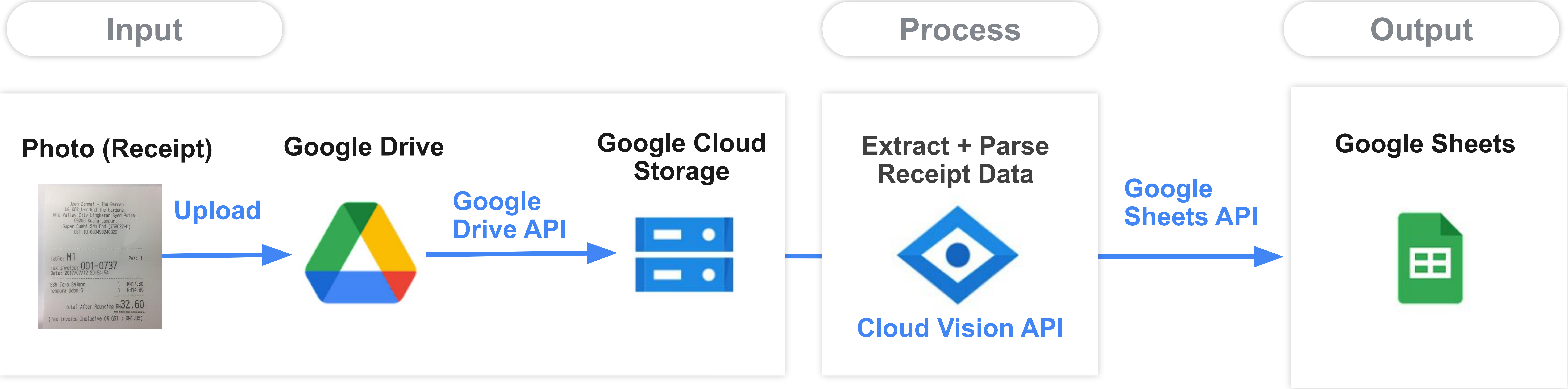
03 GET and POST requests

04 Hands-On Session: Linking frontend (web page) with backend (Google Sheet) using Google Sheet API

What we'll be doing today…

Receipt Extractor

Workflow



Ozen Zanmai - The Garden
LG K02,Lwr Gnd,The Gardens,
Mid Valley City,Lingkaran Syed Putra,
59200 Kuala Lumpur.
Super Sushi Sdn Bhd (758027-D)
GST ID:000493240320

Table: M1 PAX: 1
Tax Invoice: 001-0737
Date: 2017/07/12 20:54:54

SSM Toro Salmon	1	RM17.80
Tempura Udon S	1	RM14.80

Total After Rounding RM32.60

(Tax Invoice Inclusive 6% GST : RM1.85)

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2.0 Introducing Cloud Storage

Cloud storage

A service for storing your **objects** (data/files/info) in Google Cloud

So... where do you store it?

```
function filterStudies({ studies, filterByOrg = false, filte
         = studies.filter(study => {
                              d organizat
```

We store food in Tupperware©

GCP store **objects** in Cloud **Bucket**

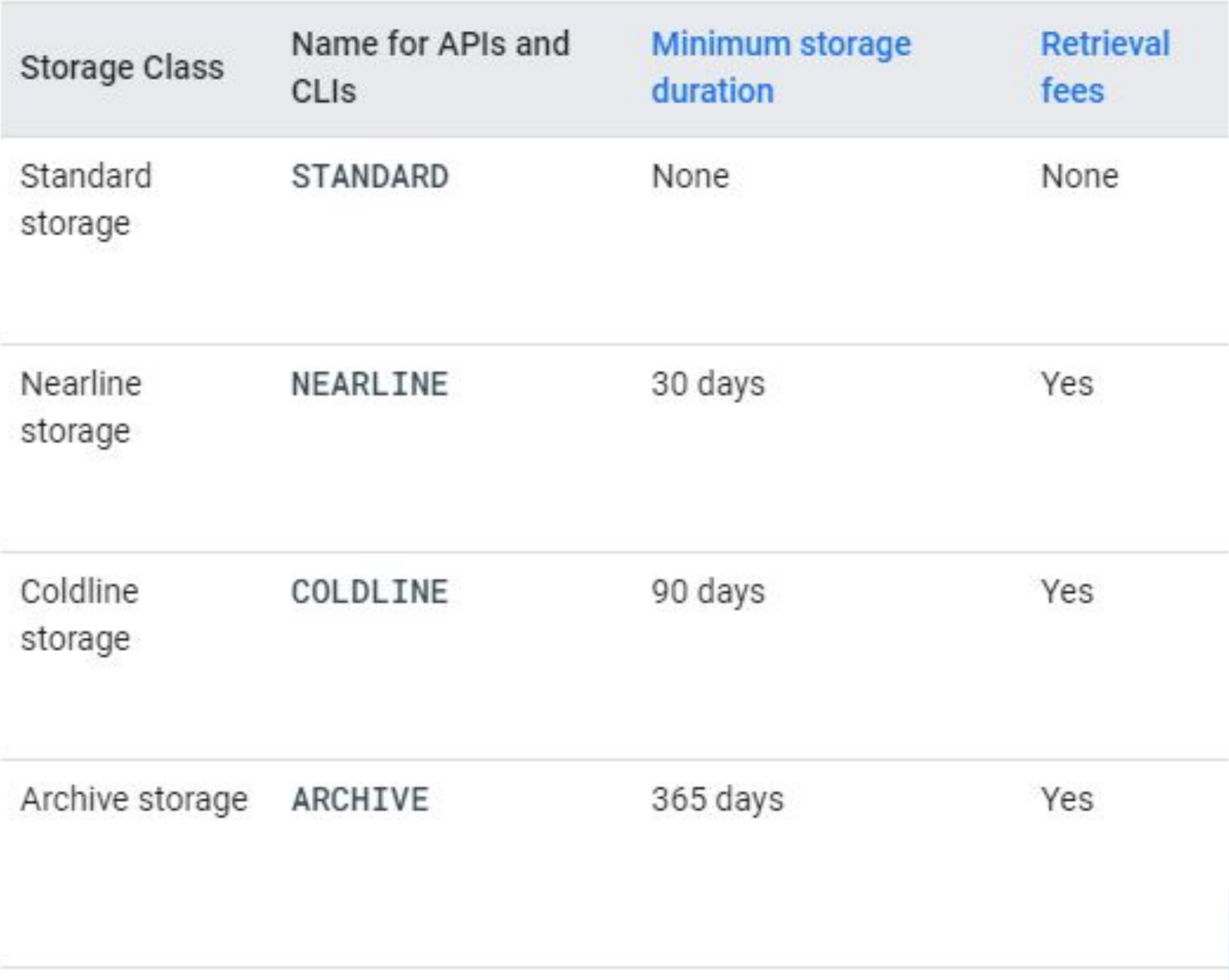
```
function filterStudies({ studies, filterByOrg = false, filte
          = studies.filter(study => {
```

There is no limit to the number of buckets you can have in a project

Creating a bucket:

1. Name your bucket - Unique but not private
2. Choose where to store your data - Latency
3. Choose a storage class - 4 types
4. Choose how to control - Public Access Prevention
5. Choose how to protect - Data Encryption

Storage Class



Storage Class	Name for APIs and CLIs	Minimum storage duration	Retrieval fees
Standard storage	`STANDARD`	None	None
Nearline storage	`NEARLINE`	30 days	Yes
Coldline storage	`COLDLINE`	90 days	Yes
Archive storage	`ARCHIVE`	365 days	Yes

Drive vs Bucket

Public

Storage, collaborative editing, file sharing

Easy management

Cloud storage

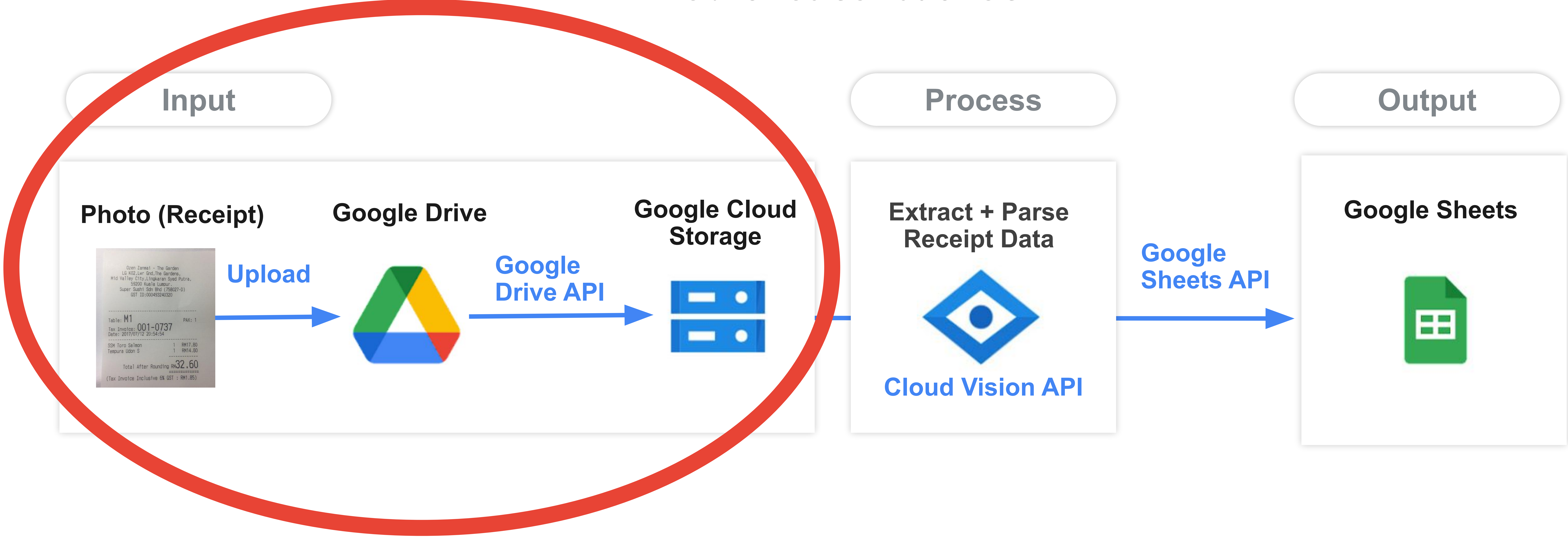
Developers

Extended functionalities

Technical demand

Workflow

1. Create drive folder
2. Upload receipt images
3. Create bucket



Input

Photo (Receipt)

Ozen Zanmai - The Garden
LG K02,Lwr Gnd,The Gardens,
Mid Valley City,Lingkaran Syed Putra,
59200 Kuala Lumpur.
Super Sushi Sdn Bhd (758027-D)
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Total After Rounding RM32.60

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Break + Q&A

```
function filterStudies({ studies, filterByOrg = false, filte
                          studies.filter(study => {
                                              organizat
```

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3.0 Introducing Cloud Vision API

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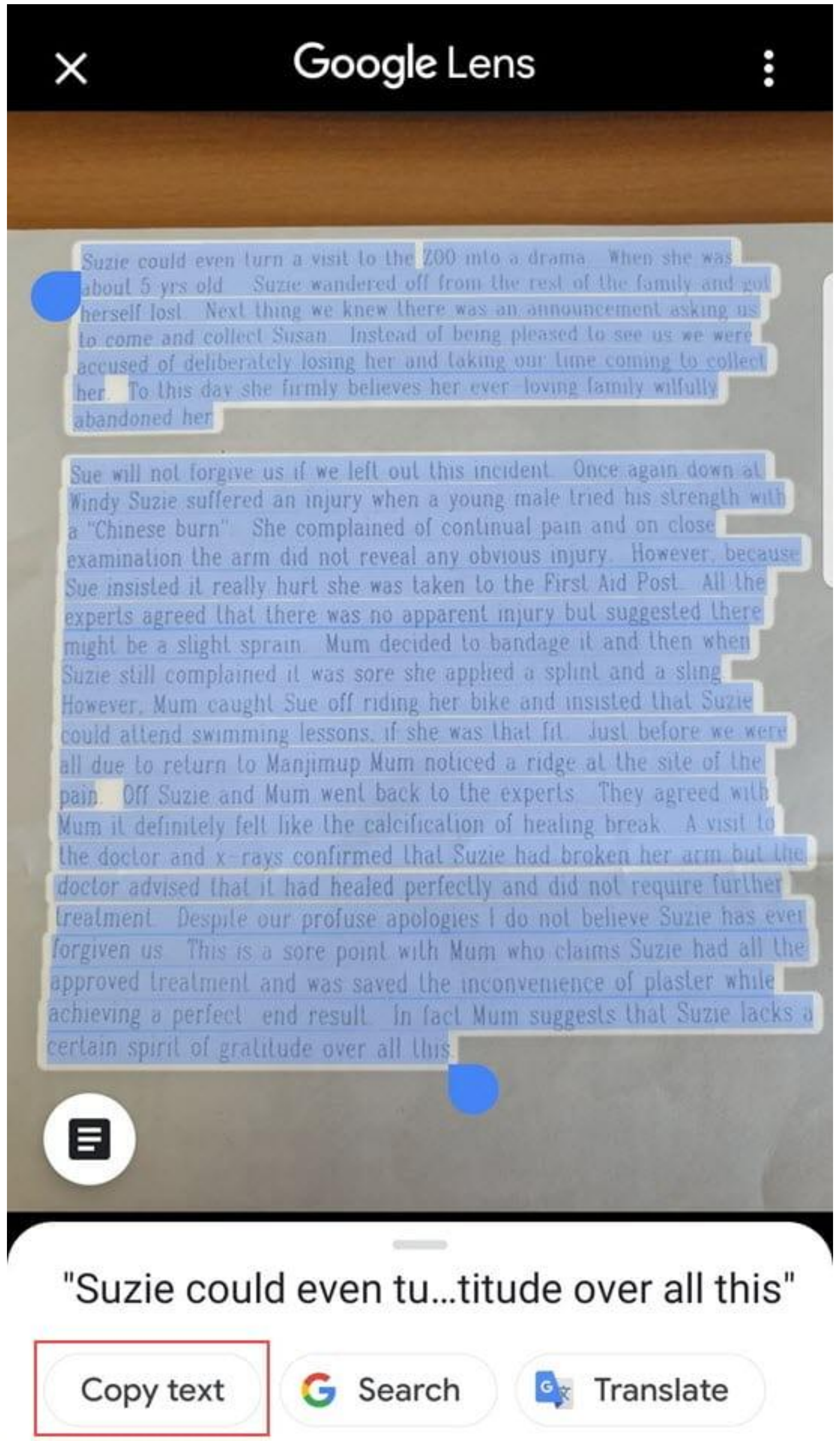
Optical Character Recognition (OCR)

The process that converts an image of text into a machine-readable text format.

Vertex AI

Vision AI

Auto ML



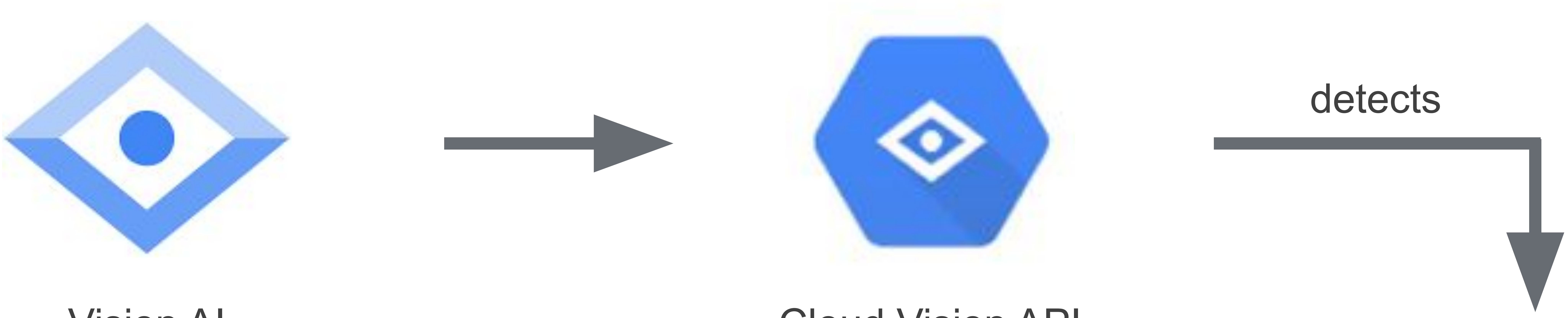
Suzie could even turn a visit to the ZOO into a drama. When she was about 5 yrs old Suzie wandered off from the rest of the family and got herself lost. Next thing we knew there was an announcement asking us to come and collect Susan. Instead of being pleased to see us we were accused of deliberately losing her and taking our time coming to collect her. To this day she firmly believes her ever-loving family wilfully abandoned her.

Sue will not forgive us if we left out this incident. Once again down at Windy Suzie suffered an injury when a young male tried his strength with a "Chinese burn". She complained of continual pain and on close examination the arm did not reveal any obvious injury. However, because Sue insisted it really hurt she was taken to the First Aid Post. All the experts agreed that there was no apparent injury but suggested there might be a slight sprain. Mum decided to bandage it and then when Suzie still complained it was sore she applied a splint and a sling. However, Mum caught Sue off riding her bike and insisted that Suzie could attend swimming lessons, if she was that fit. Just before we were all due to return to Manjimup Mum noticed a ridge at the site of the pain. Off Suzie and Mum went back to the experts. They agreed with Mum it definitely felt like the calcification of healing break. A visit to the doctor and x-rays confirmed that Suzie had broken her arm but the doctor advised that it had healed perfectly and did not require further treatment. Despite our profuse apologies I do not believe Suzie has ever forgiven us. This is a sore point with Mum who claims Suzie had all the approved treatment and was saved the inconvenience of plaster while achieving a perfect end result. In fact Mum suggests that Suzie lacks a certain spirit of gratitude over all this.

"Suzie could even tu...titude over all this"

Optical Character Recognition (OCR)

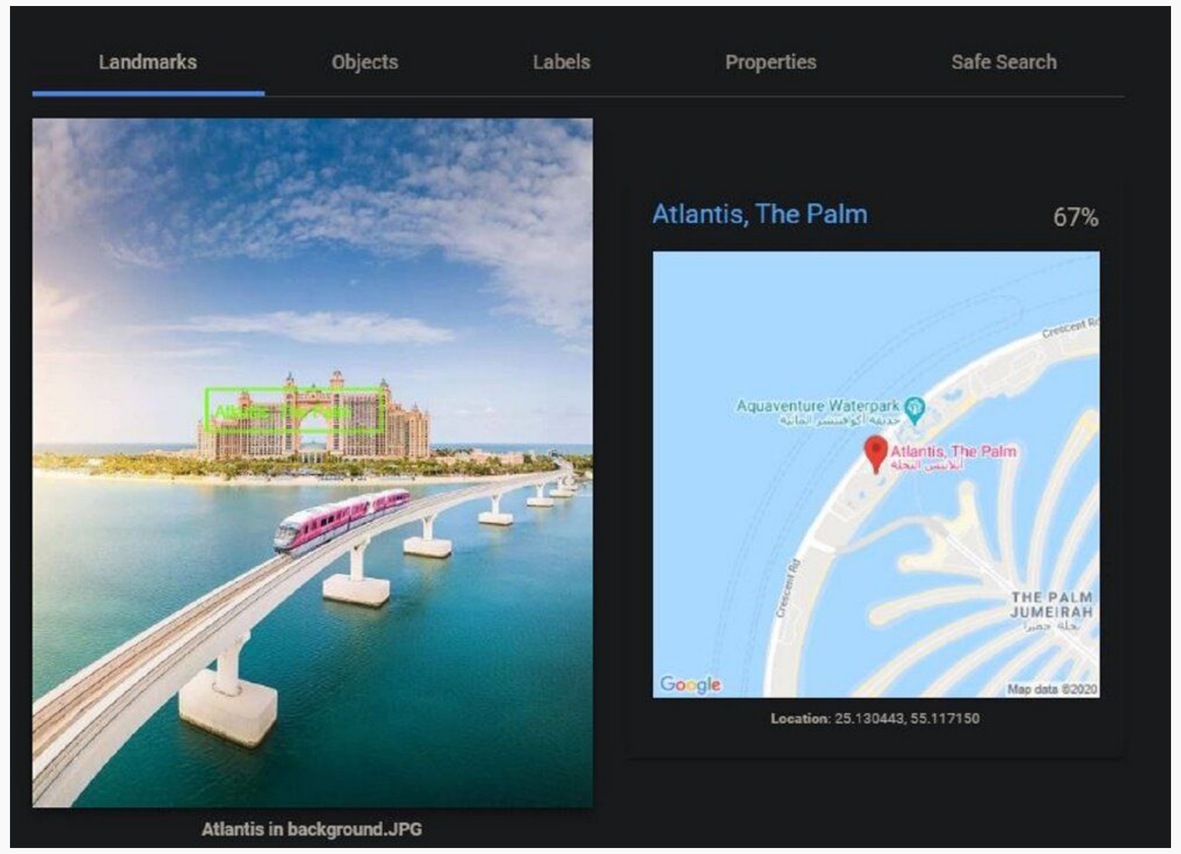
- OCR involves analyzing and identifying patterns in images using **machine learning models**, such as convolutional neural networks (CNNs).
- CNN is a supervised learning technique that require vast amounts of labeled data to train on.
- With Google Cloud Vision API, we can utilize pre-trained models for OCR, eliminating the need to train our own models.



Vision AI

Cloud Vision API

Explicit content
(Safe search)



Landmarks Objects Labels Properties Safe Search

Atlantis, The Palm 67%

Location: 25.130443, 55.117150

Atlantis in background.JPG

Landmarks

Logos

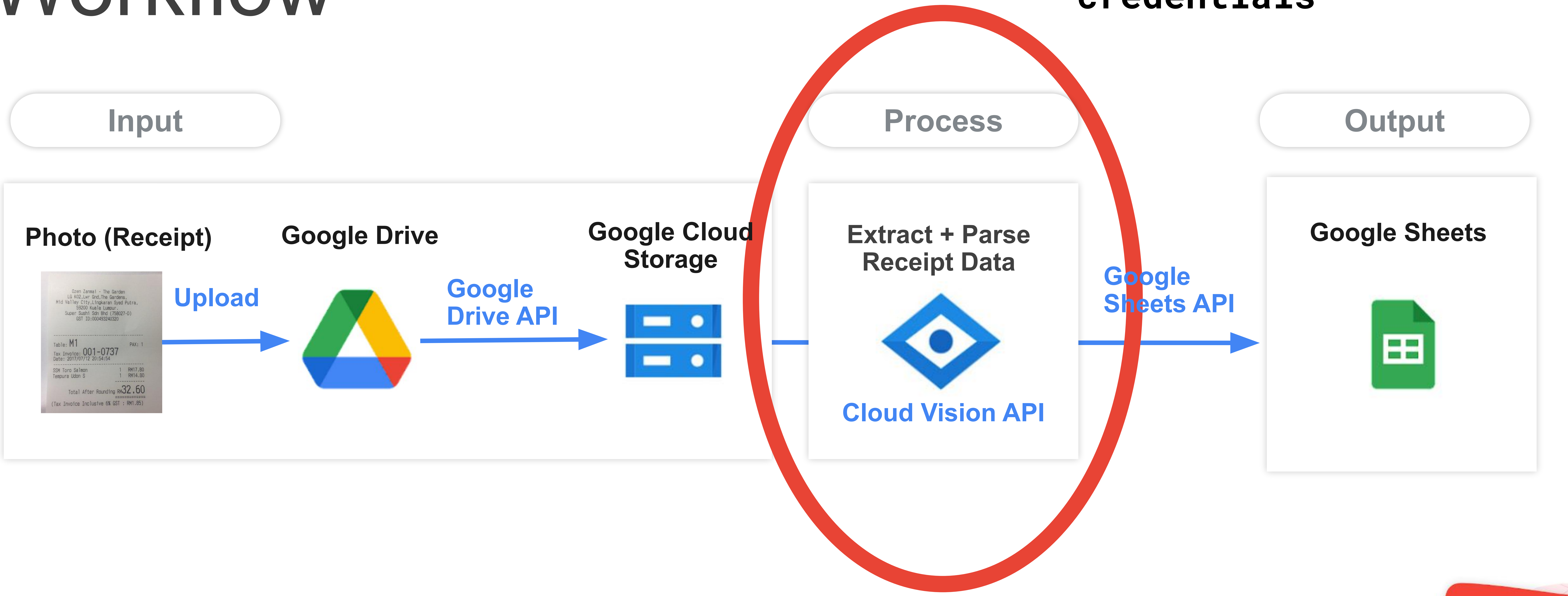
Faces

Cloud Vision API

Detect text in image

Workflow

1. Enable API
2. Configure authorization credentials



Input

Photo (Receipt)

Ozen Zanmai - The Garden
LG K02,Lwr Gnd,The Gardens,
Mid Valley City,Lingkaran Syed Putra,
59200 Kuala Lumpur.
Super Sushi Sdn Bhd (758027-D)
GST ID:000493240320

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SSM Toro Salmon 1 RM17.80
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Upload

Google Drive

Google Drive API

Google Cloud Storage

Process

Extract + Parse Receipt Data

Cloud Vision API

Google Sheets API

Output

Google Sheets

Enable APIs

Google Drive API

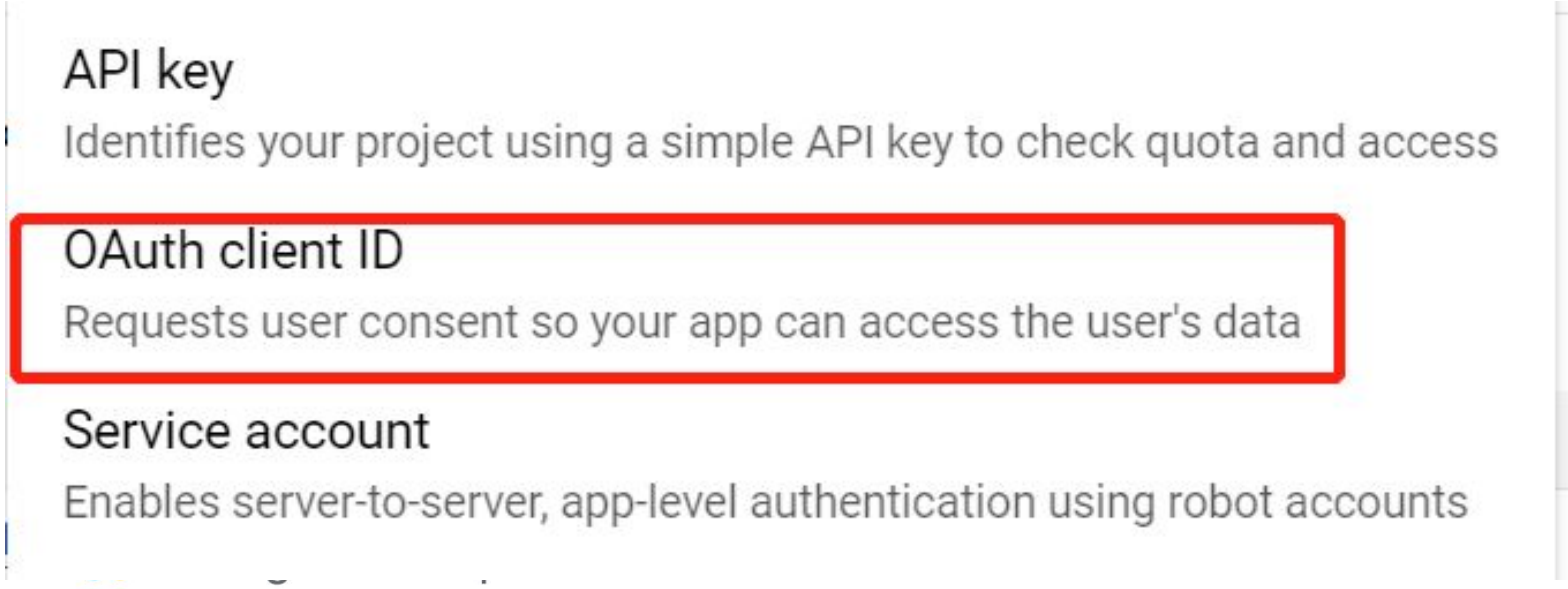
Cloud Vision API

Google Sheets API

OAuth consent screen and credentials:

1. OAuth consent screen

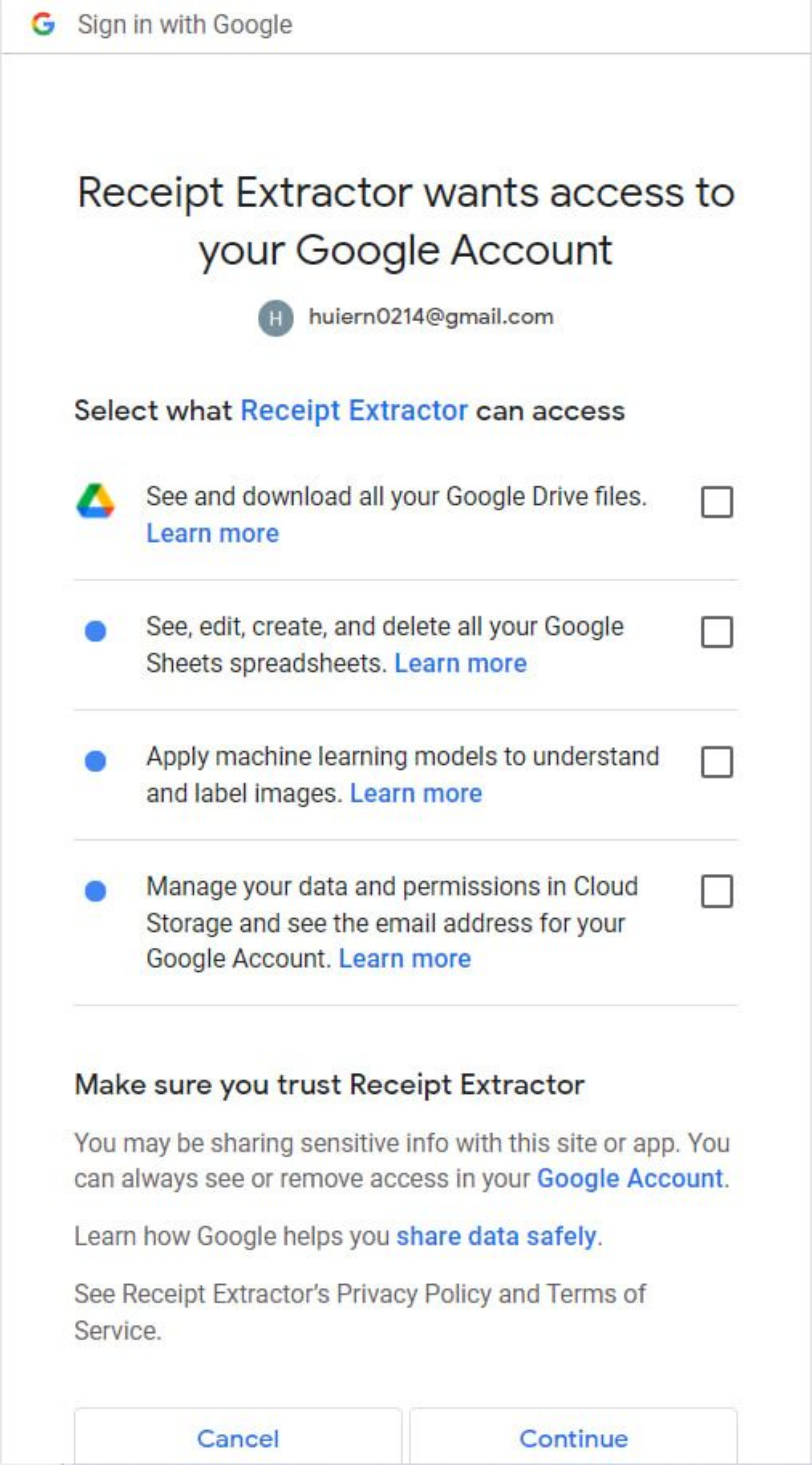
2. Credentials (OAuth Client ID)
  - To authenticate the application and get permission to use the API



API key
Identifies your project using a simple API key to check quota and access

OAuth client ID
Requests user consent so your app can access the user's data

Service account
Enables server-to-server, app-level authentication using robot accounts



Receipt Extractor wants access to your Google Account

huiern0214@gmail.com

Select what Receipt Extractor can access

- See and download all your Google Drive files. Learn more ☐
- See, edit, create, and delete all your Google Sheets spreadsheets. Learn more ☐
- Apply machine learning models to understand and label images. Learn more ☐
- Manage your data and permissions in Cloud Storage and see the email address for your Google Account. Learn more ☐

Make sure you trust Receipt Extractor

You may be sharing sensitive info with this site or app. You can always see or remove access in your Google Account.

Learn how Google helps you share data safely.

See Receipt Extractor's Privacy Policy and Terms of Service.

OAuth consent screen

```
# process credentials for OAuth2 tokens
SCOPES = (
    'https://www.googleapis.com/auth/drive.readonly',
    'https://www.googleapis.com/auth/devstorage.full_control',
    'https://www.googleapis.com/auth/cloud-vision',
    'https://www.googleapis.com/auth/spreadsheets',
)
```

Break + Q&A

```
function filterStudies({ studies, filterByOrg = false, filte
           = studies.filter(study => {
                              ed organizat
```

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4.0 JSON and Google Sheets

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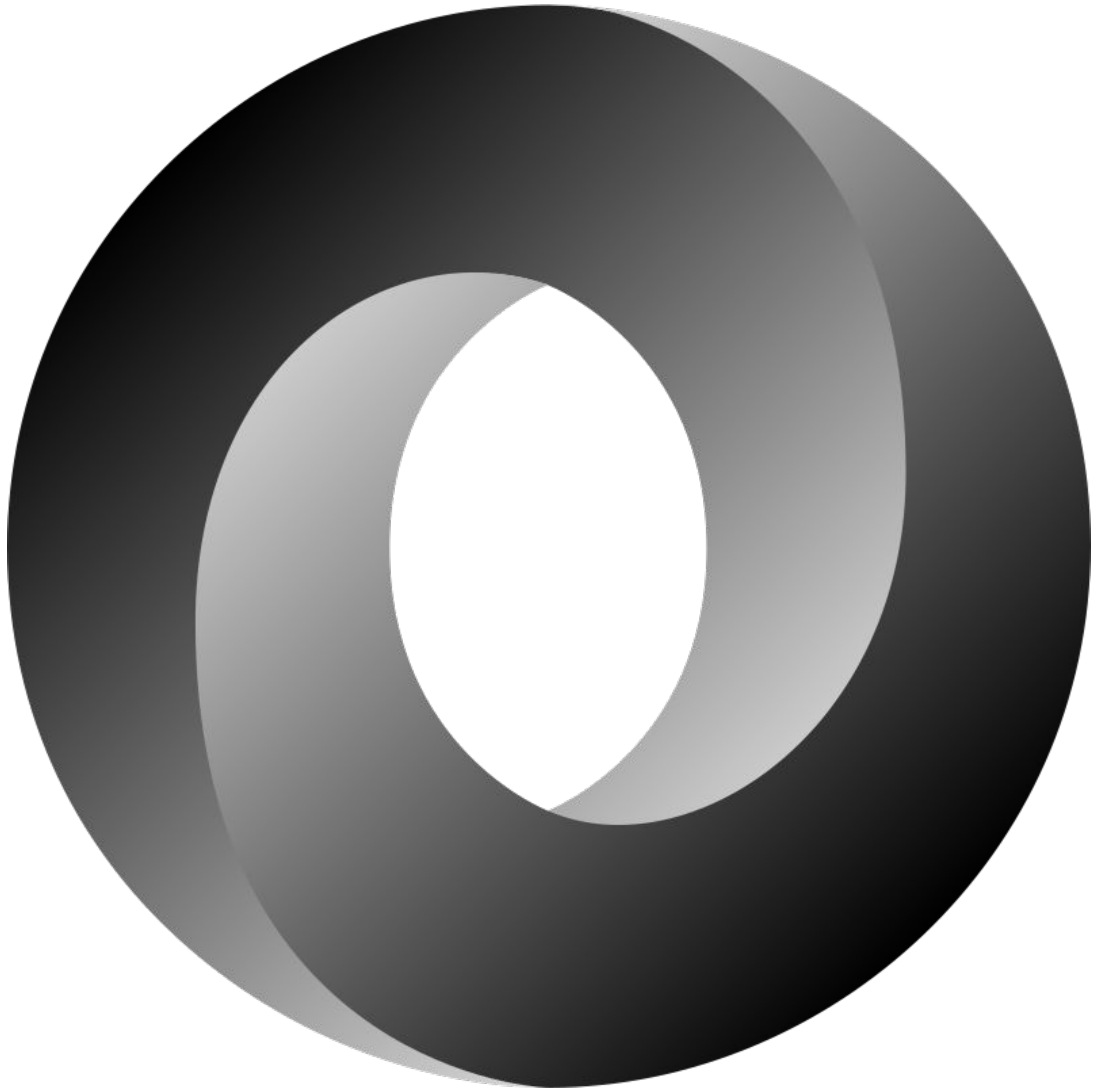
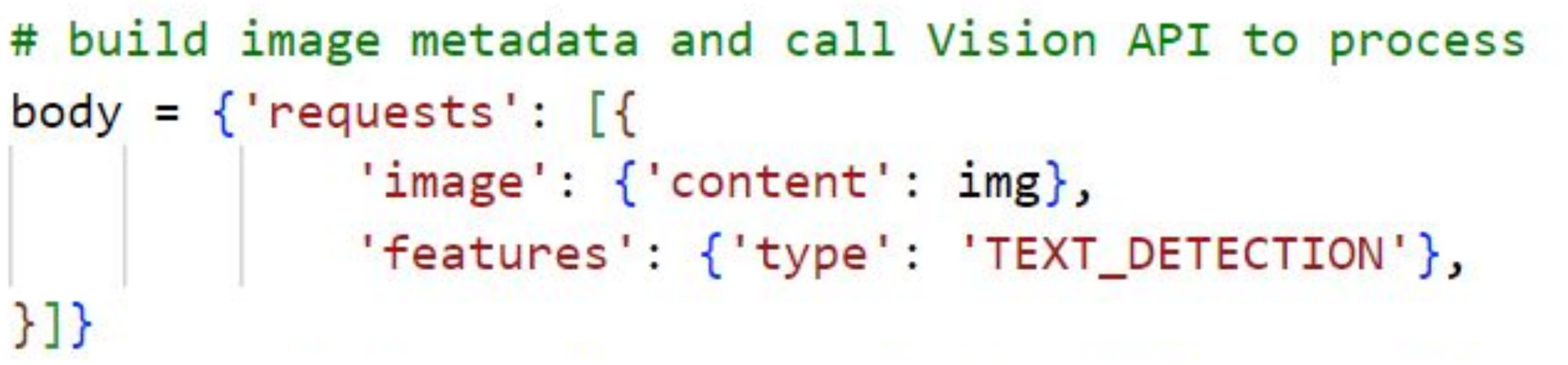
JSON - JavaScript Object Notation

- Extension of JavaScript
- Open standard file format and data interchange format
- Uses human-readable text
- Attribute–value pairs
- Store and transmit data



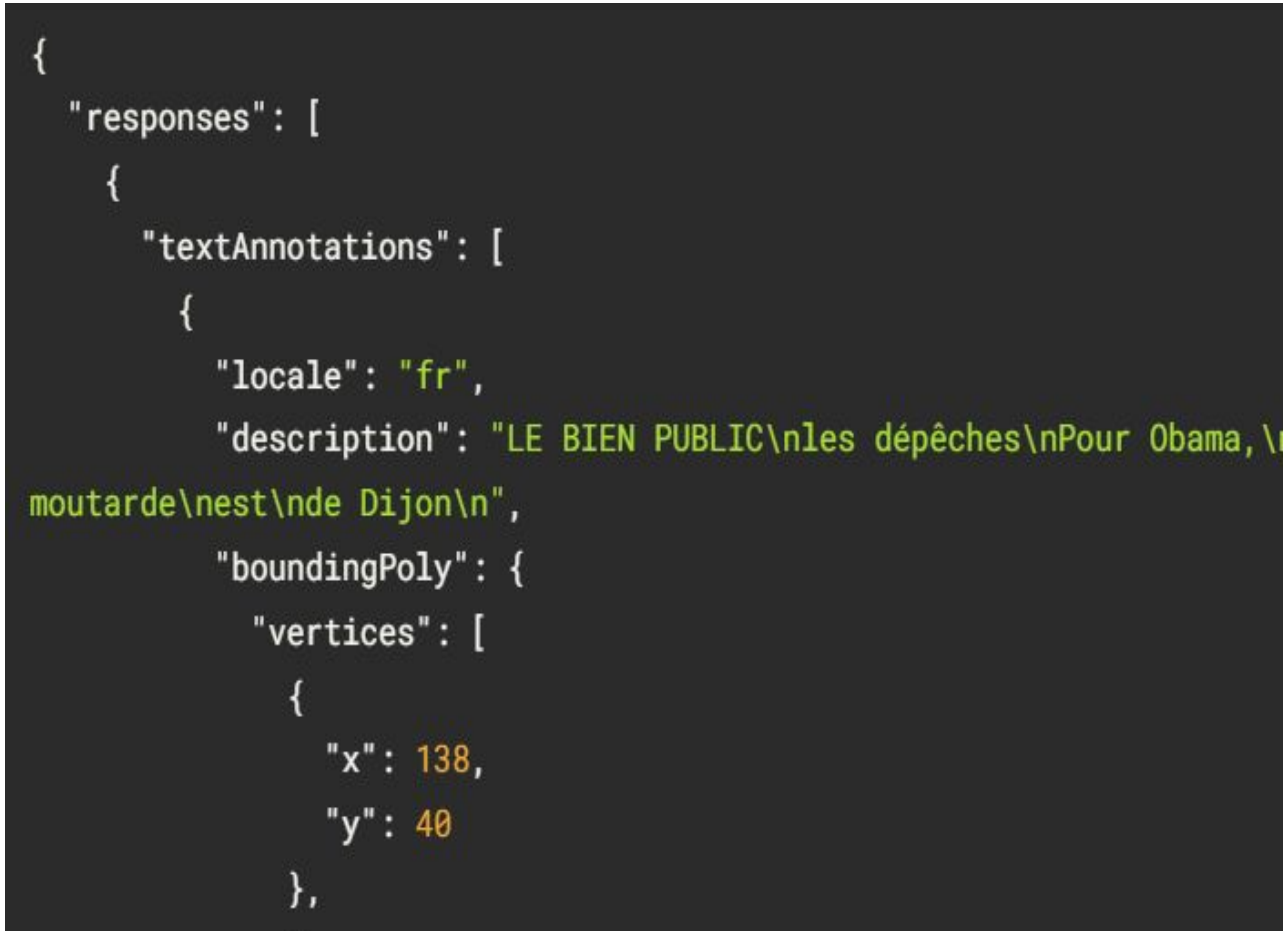
Using JSON Format in API Requests

- JSON is a common way to interact with APIs.
- It is often used as the data format for the request body when sending data to an API endpoint.
- JSON allows for structured and organized data transfer.
- Sample code using JSON format for API requests:

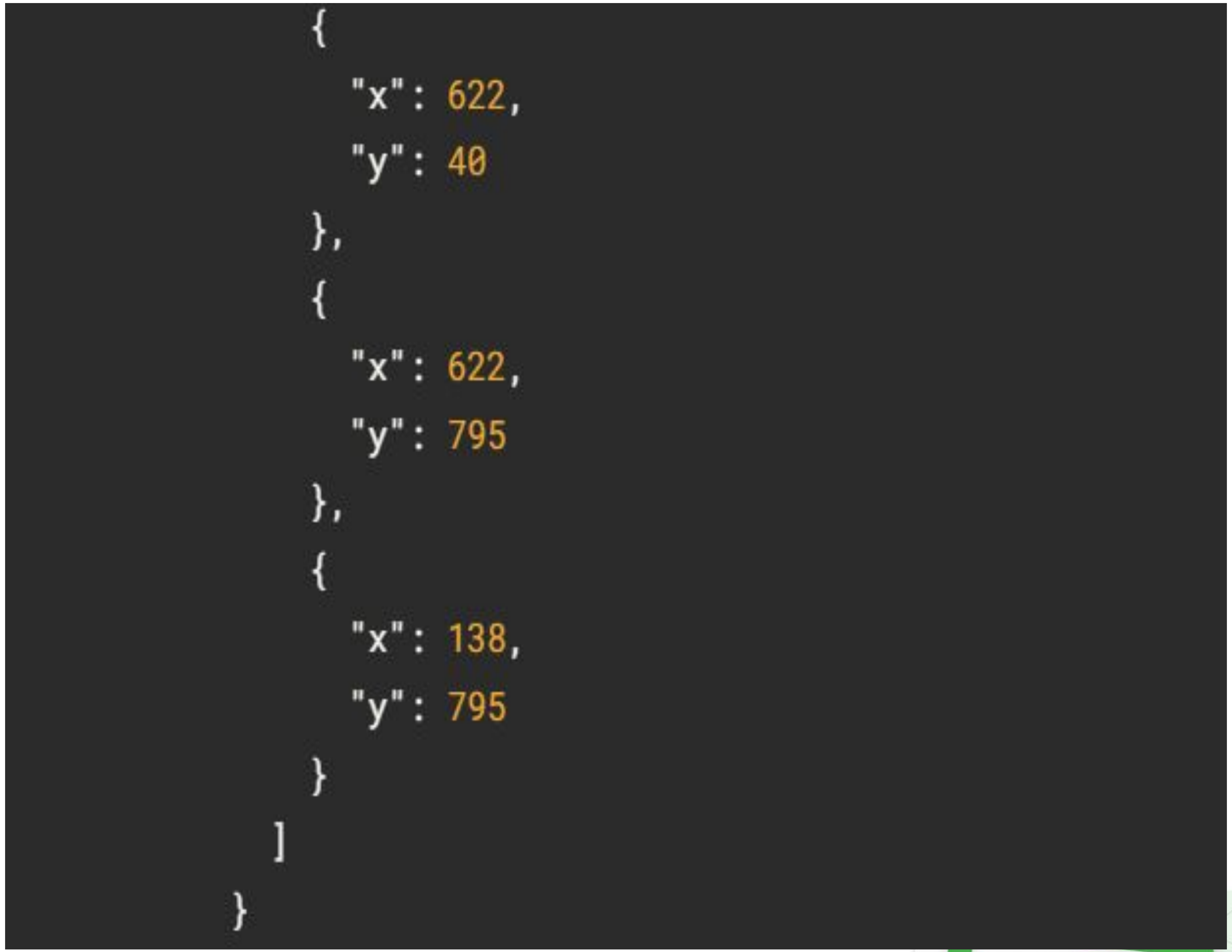


```
# build image metadata and call Vision API to process
body = {'requests': [{
            'image': {'content': img},
            'features': {'type': 'TEXT_DETECTION'},
}]}
```

Example output of Cloud Vision API



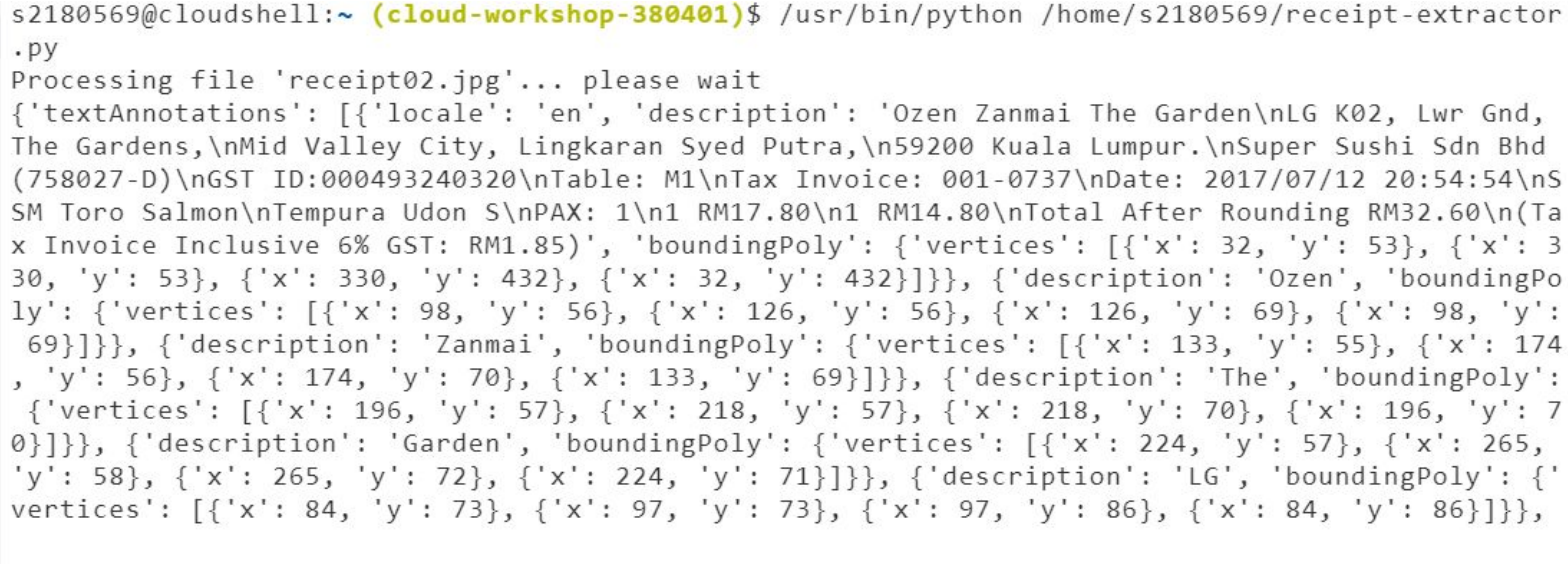
```
{
  "responses": [
    {
      "textAnnotations": [
        {
          "locale": "fr",
          "description": "LE BIEN PUBLIC\nles dépêches\nPour Obama,\
moutarde\nest\nde Dijon\n",
          "boundingPoly": {
            "vertices": [
              {
                "x": 138,
                "y": 40
              },
```



```
              {
                "x": 622,
                "y": 40
              },
              {
                "x": 622,
                "y": 795
              },
              {
                "x": 138,
                "y": 795
              }
            ]
          }
```

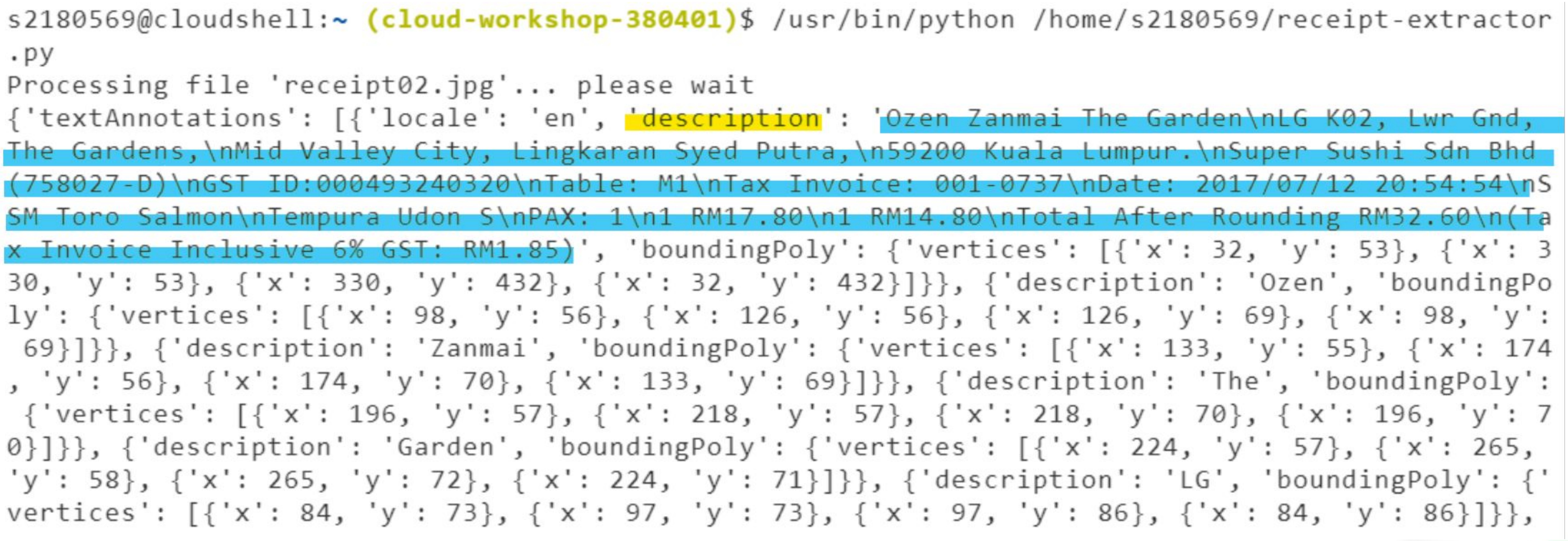
JSON is hierarchical!

Example output of Cloud Vision API



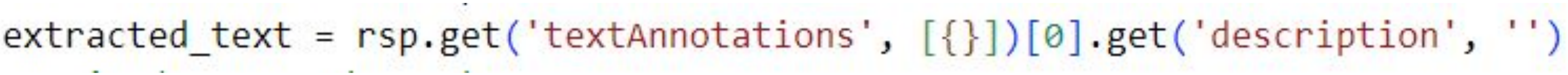
```
s2180569@cloudshell:~ (cloud-workshop-380401)$ /usr/bin/python /home/s2180569/receipt-extractor
.py
Processing file 'receipt02.jpg'... please wait
{'textAnnotations': [{'locale': 'en', 'description': 'Ozen Zanmai The Garden\nLG K02, Lwr Gnd,
The Gardens,\nMid Valley City, Lingkaran Syed Putra,\n59200 Kuala Lumpur.\nSuper Sushi Sdn Bhd
(758027-D)\nGST ID:000493240320\nTable: M1\nTax Invoice: 001-0737\nDate: 2017/07/12 20:54:54\nS
SM Toro Salmon\nTempura Udon S\nPAX: 1\n1 RM17.80\n1 RM14.80\nTotal After Rounding RM32.60\n(Ta
x Invoice Inclusive 6% GST: RM1.85)', 'boundingPoly': {'vertices': [{'x': 32, 'y': 53}, {'x': 3
30, 'y': 53}, {'x': 330, 'y': 432}, {'x': 32, 'y': 432}]}}, {'description': 'Ozen', 'boundingPo
ly': {'vertices': [{'x': 98, 'y': 56}, {'x': 126, 'y': 56}, {'x': 126, 'y': 69}, {'x': 98, 'y':
 69}]}}, {'description': 'Zanmai', 'boundingPoly': {'vertices': [{'x': 133, 'y': 55}, {'x': 174
, 'y': 56}, {'x': 174, 'y': 70}, {'x': 133, 'y': 69}]}}, {'description': 'The', 'boundingPoly':
 {'vertices': [{'x': 196, 'y': 57}, {'x': 218, 'y': 57}, {'x': 218, 'y': 70}, {'x': 196, 'y': 7
0}]}}, {'description': 'Garden', 'boundingPoly': {'vertices': [{'x': 224, 'y': 57}, {'x': 265,
'y': 58}, {'x': 265, 'y': 72}, {'x': 224, 'y': 71}]}}, {'description': 'LG', 'boundingPoly': {'
vertices': [{'x': 84, 'y': 73}, {'x': 97, 'y': 73}, {'x': 97, 'y': 86}, {'x': 84, 'y': 86}]}},
```

Example output of Cloud Vision API

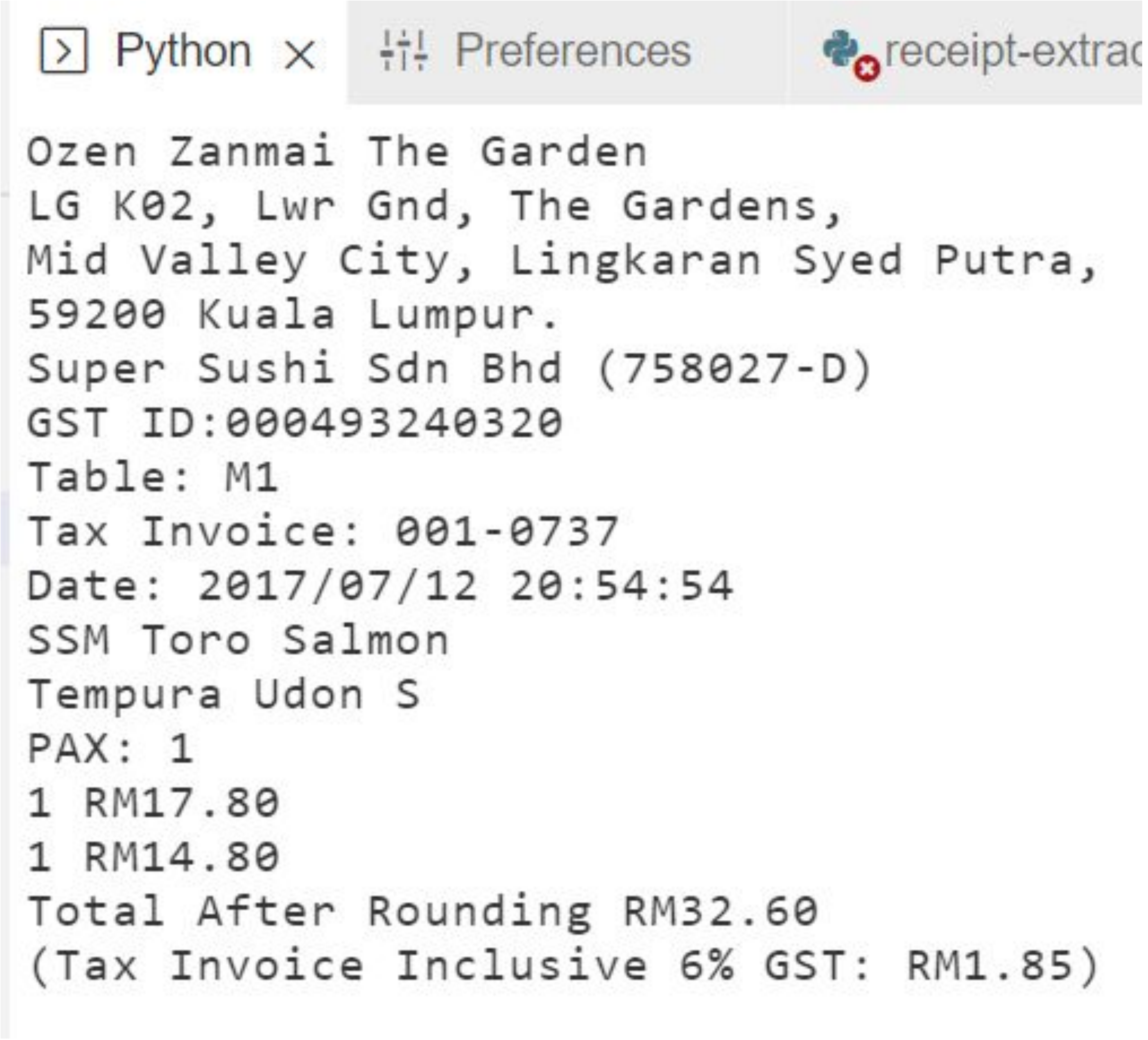


```
s2180569@cloudshell:~ (cloud-workshop-380401)$ /usr/bin/python /home/s2180569/receipt-extractor
.py
Processing file 'receipt02.jpg'... please wait
{'textAnnotations': [{'locale': 'en', 'description': 'Ozen Zanmai The Garden\nLG K02, Lwr Gnd,
The Gardens,\nMid Valley City, Lingkaran Syed Putra,\n59200 Kuala Lumpur.\nSuper Sushi Sdn Bhd
(758027-D)\nGST ID:000493240320\nTable: M1\nTax Invoice: 001-0737\nDate: 2017/07/12 20:54:54\nS
SM Toro Salmon\nTempura Udon S\nPAX: 1\n1 RM17.80\n1 RM14.80\nTotal After Rounding RM32.60\n(Ta
x Invoice Inclusive 6% GST: RM1.85)', 'boundingPoly': {'vertices': [{'x': 32, 'y': 53}, {'x': 3
30, 'y': 53}, {'x': 330, 'y': 432}, {'x': 32, 'y': 432}]}}, {'description': 'Ozen', 'boundingPo
ly': {'vertices': [{'x': 98, 'y': 56}, {'x': 126, 'y': 56}, {'x': 126, 'y': 69}, {'x': 98, 'y':
 69}]}}, {'description': 'Zanmai', 'boundingPoly': {'vertices': [{'x': 133, 'y': 55}, {'x': 174
, 'y': 56}, {'x': 174, 'y': 70}, {'x': 133, 'y': 69}]}}, {'description': 'The', 'boundingPoly':
 {'vertices': [{'x': 196, 'y': 57}, {'x': 218, 'y': 57}, {'x': 218, 'y': 70}, {'x': 196, 'y': 7
0}]}}, {'description': 'Garden', 'boundingPoly': {'vertices': [{'x': 224, 'y': 57}, {'x': 265,
'y': 58}, {'x': 265, 'y': 72}, {'x': 224, 'y': 71}]}}, {'description': 'LG', 'boundingPoly': {'
vertices': [{'x': 84, 'y': 73}, {'x': 97, 'y': 73}, {'x': 97, 'y': 86}, {'x': 84, 'y': 86}]}},
```

Example output of Cloud Vision API



```
extracted_text = rsp.get('textAnnotations', [{}])[0].get('description', '')
```



```
Ozen Zanmai The Garden
LG K02, Lwr Gnd, The Gardens,
Mid Valley City, Lingkaran Syed Putra,
59200 Kuala Lumpur.
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```
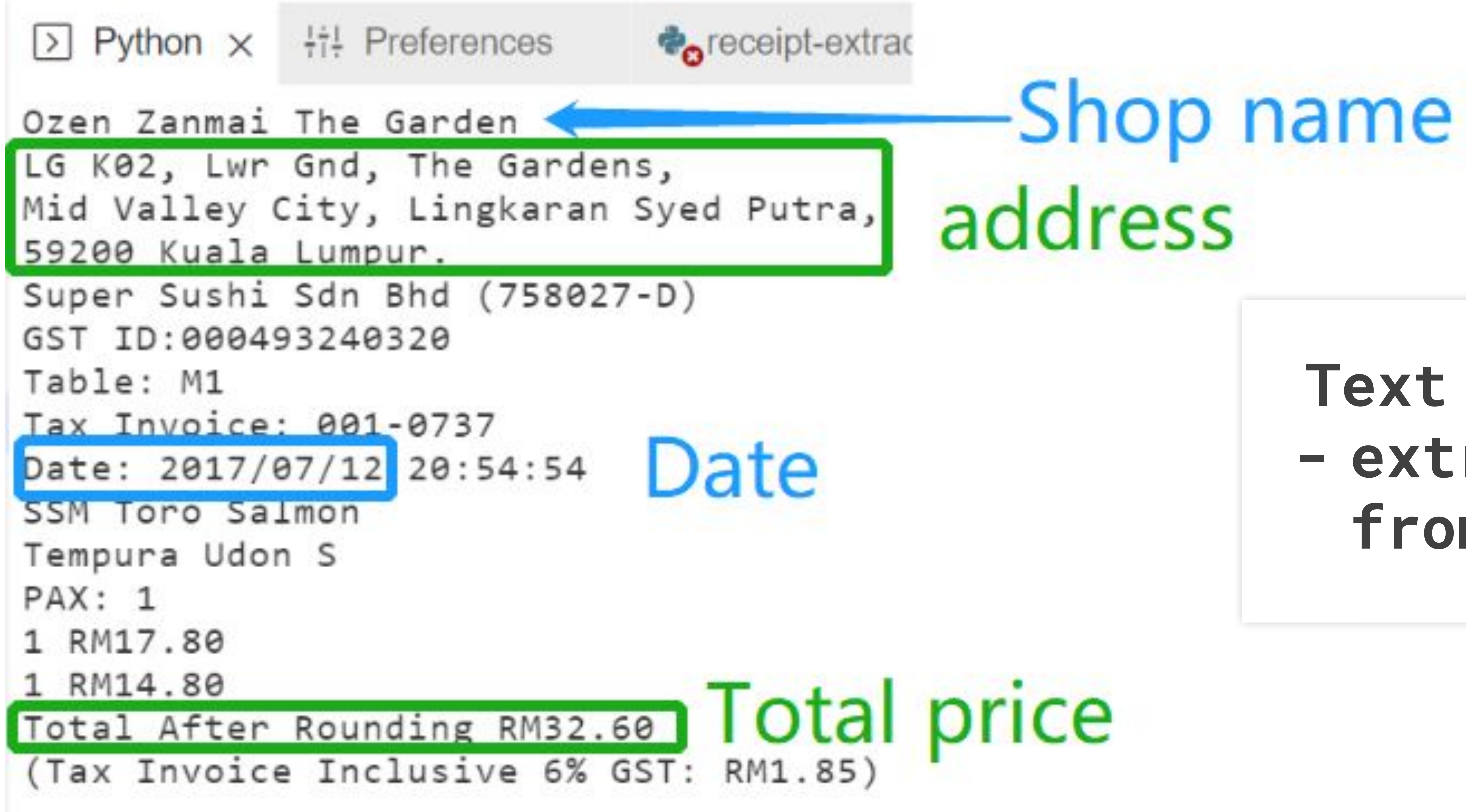

Example output of Cloud Vision API

```
extracted_text = rsp.get('textAnnotations', [{}])[0].get('description', '')
```



```
Ozen Zanmai The Garden
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SSM Toro Salmon
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PAX: 1
1 RM17.80
1 RM14.80
Total After Rounding RM32.60
(Tax Invoice Inclusive 6% GST: RM1.85)
```
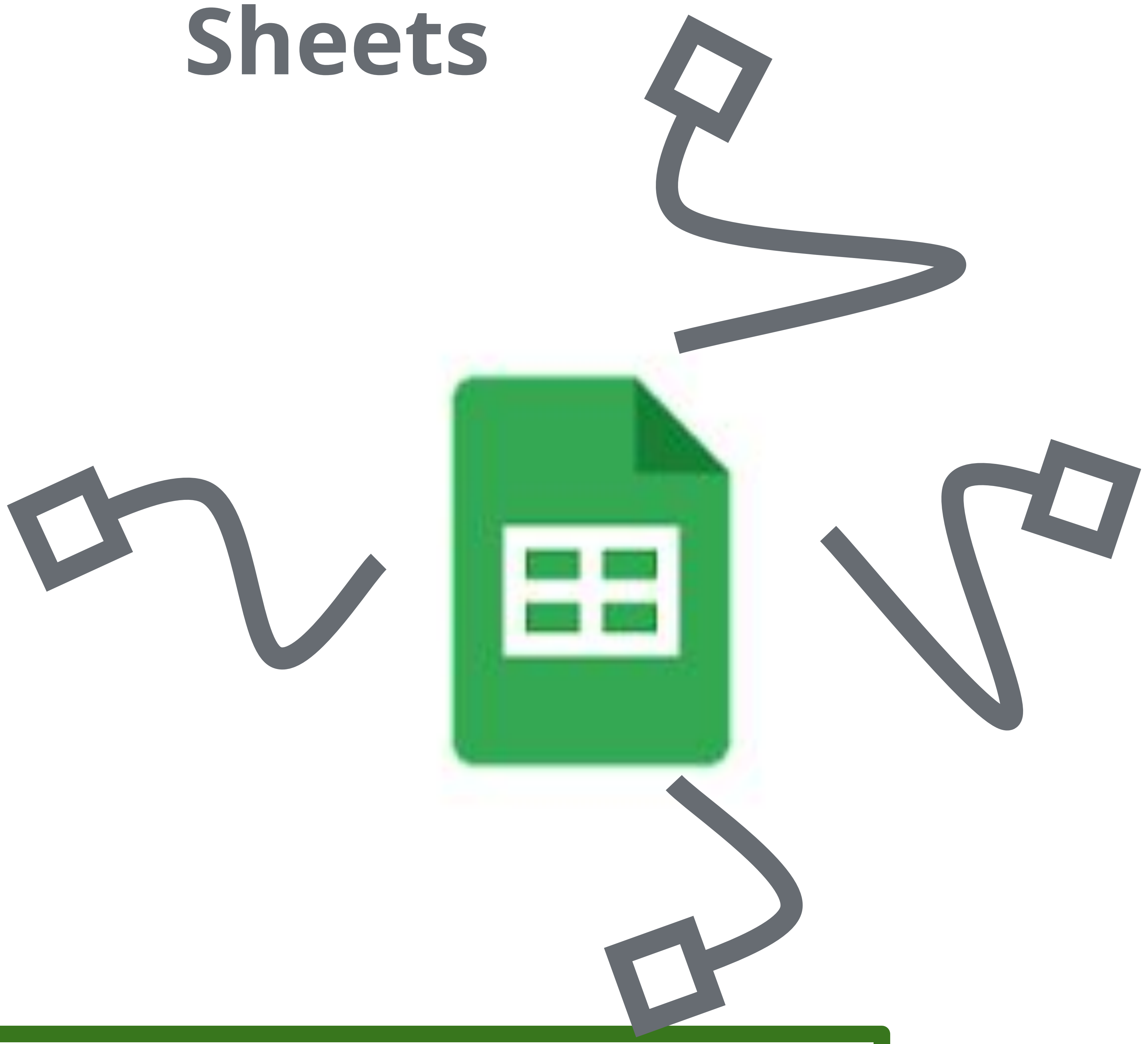

Text Parsing
- extract useful info from the text

Google Sheets API



Manage Connected Sheets

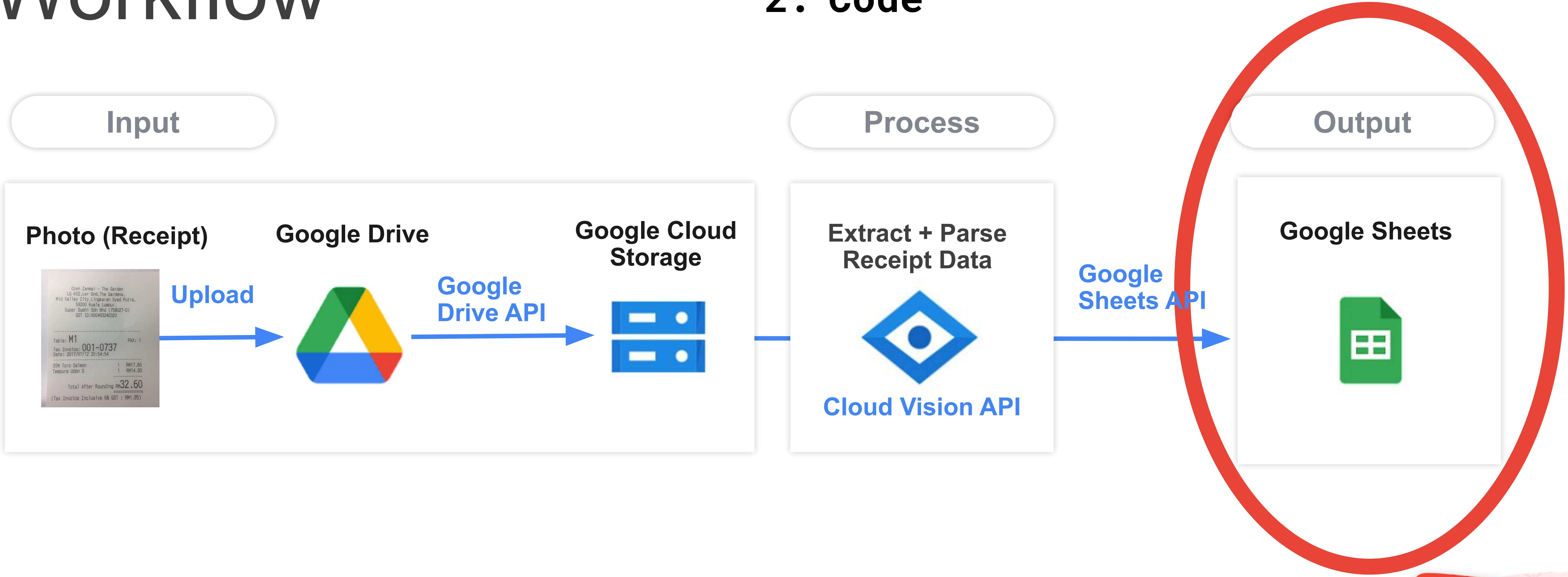
Create spreadsheet

Update spreadsheet formatting

Read and write spreadsheet cell values

Workflow

```
1. Create google sheet
2. Code
```



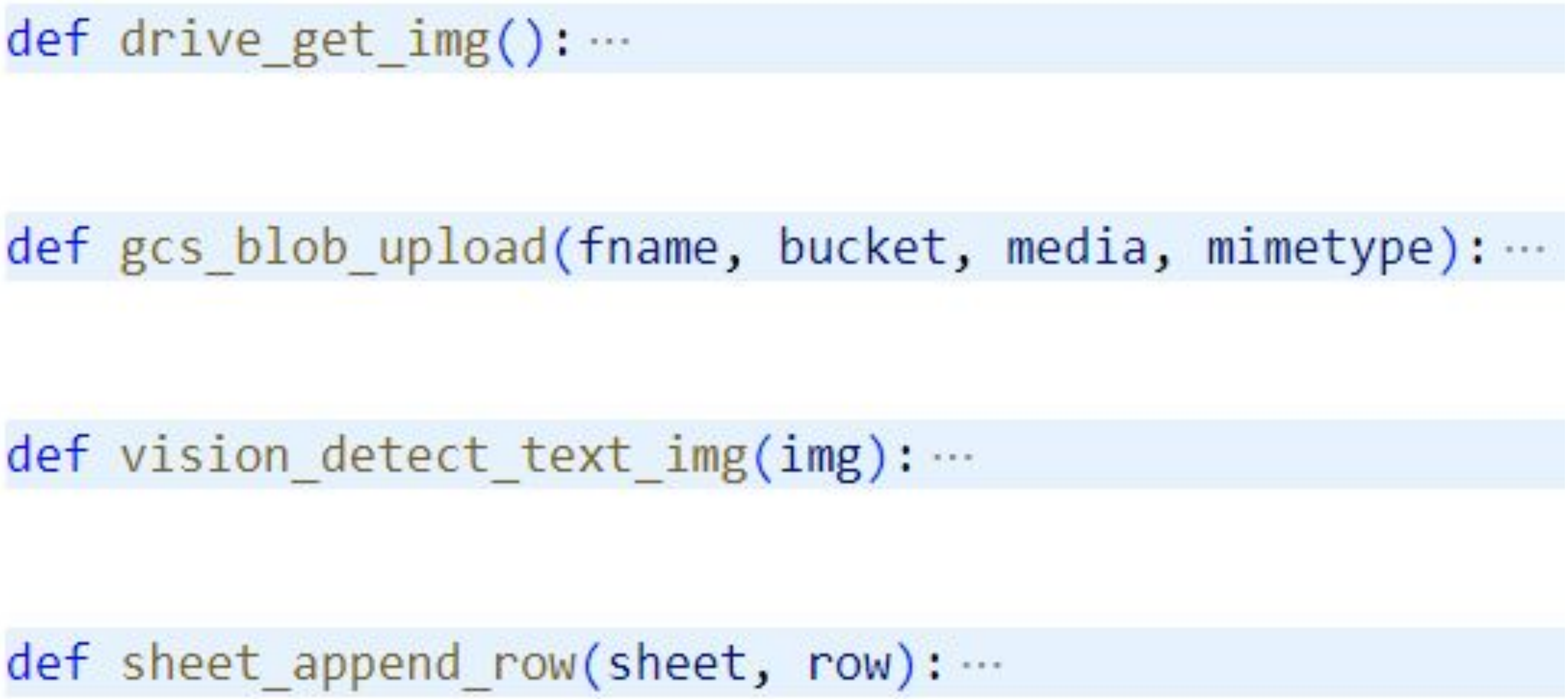
Ozen Zanmai - The Garden
LG K02,Lwr Gnd,The Gardens,
Mid Valley City,Lingkaran Syed Putra,
59200 Kuala Lumpur.
Super Sushi Sdn Bhd (758027-D)
GST ID:000493240320

```
Table: M1                        PAX: 1
Tax Invoice: 001-0737
Date: 2017/07/12 20:54:54
-------------------------------------
SSM Toro Salmon              1  RM17.80
Tempura Udon S               1  RM14.80
                             ----------
      Total After Rounding RM32.60
                             ==========
(Tax Invoice Inclusive 6% GST : RM1.85)
```

Code Structure

1. **Process Credentials & Create API endpoints**

2. **Functions**



```
def drive_get_img(): ...

def gcs_blob_upload(fname, bucket, media, mimetype): ...

def vision_detect_text_img(img): ...

def sheet_append_row(sheet, row): ...
```

3. **Combine all the functions together**

Quiz time!

```
function filterStudies({ studies, filterByOrg = false, filte
                          studies.filter(study => {
                                        ed organizat
```

Prize Giving Ceremony

Workshop 4: Integrate AI into Your Website

```
function filterStudies({ studies, filterByOrg = false, filte
                       = studies.filter(study => {
                                              ed organizat
```

Upcoming Workshop 5

Cubes, Block A FSKTM

Thank you!