CS 530 INTERNET WEB AND CLOUD SYSTEMS

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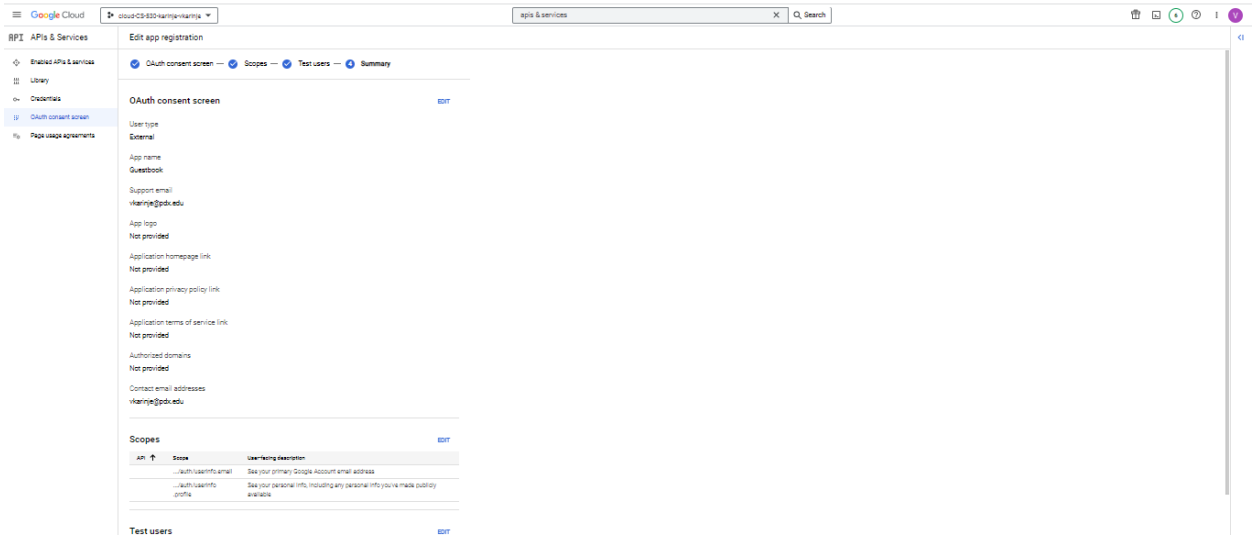
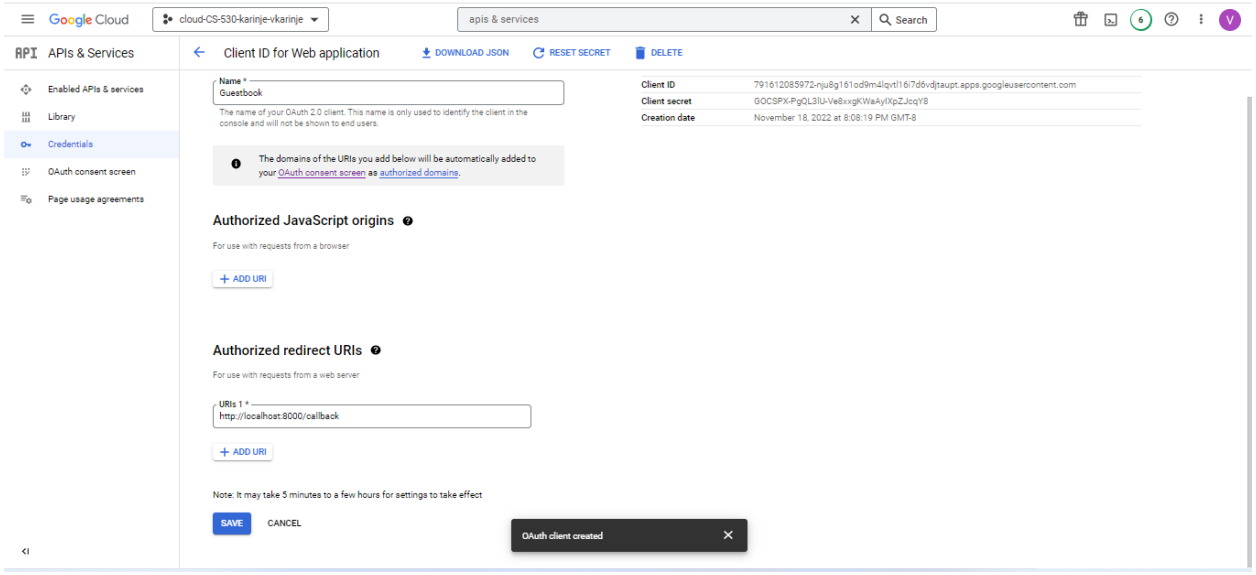
08.1 OAuth2 Guestbook

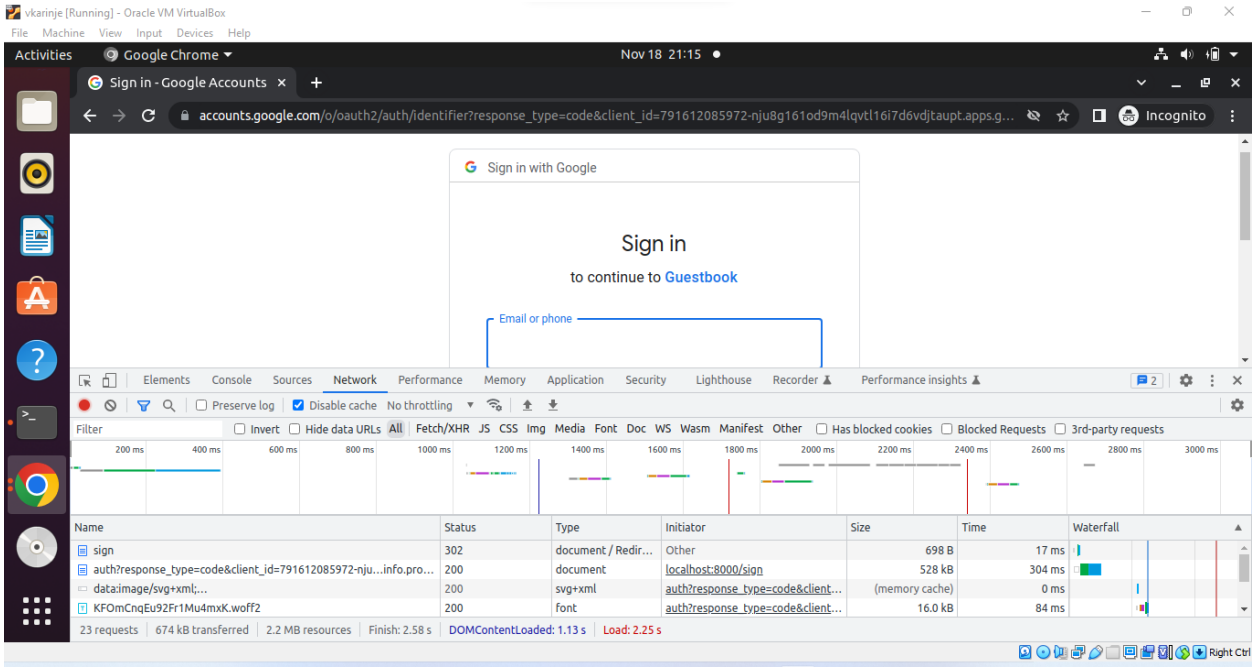
Set up Identity Provider



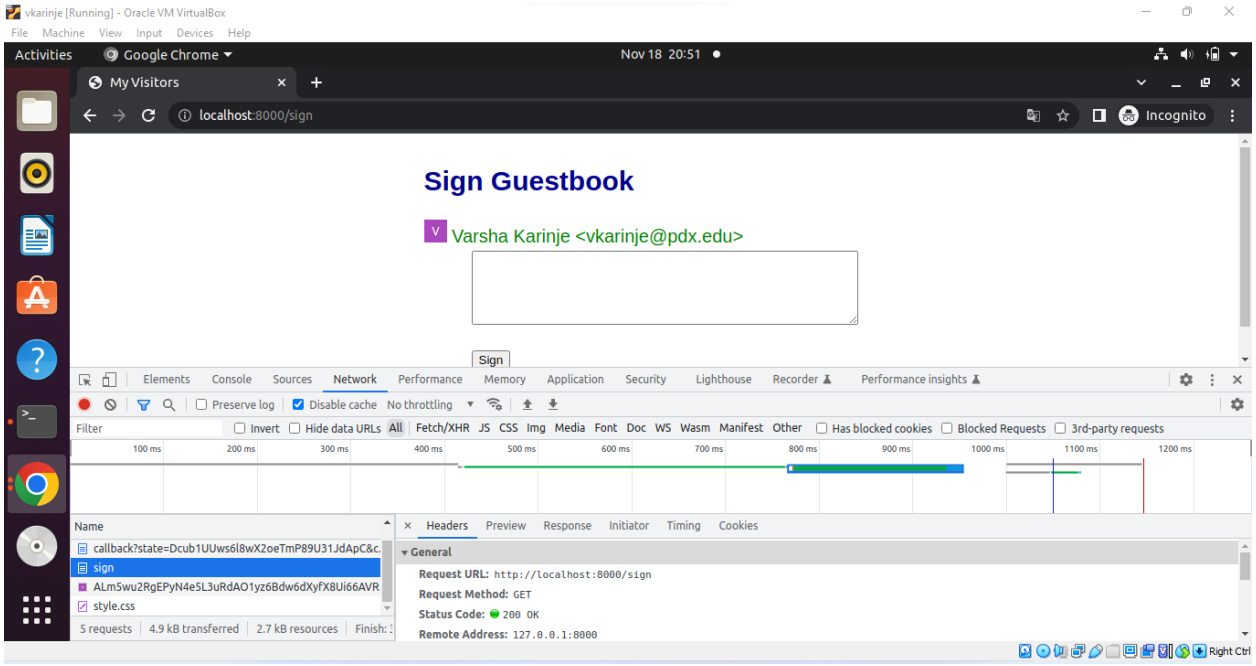
-

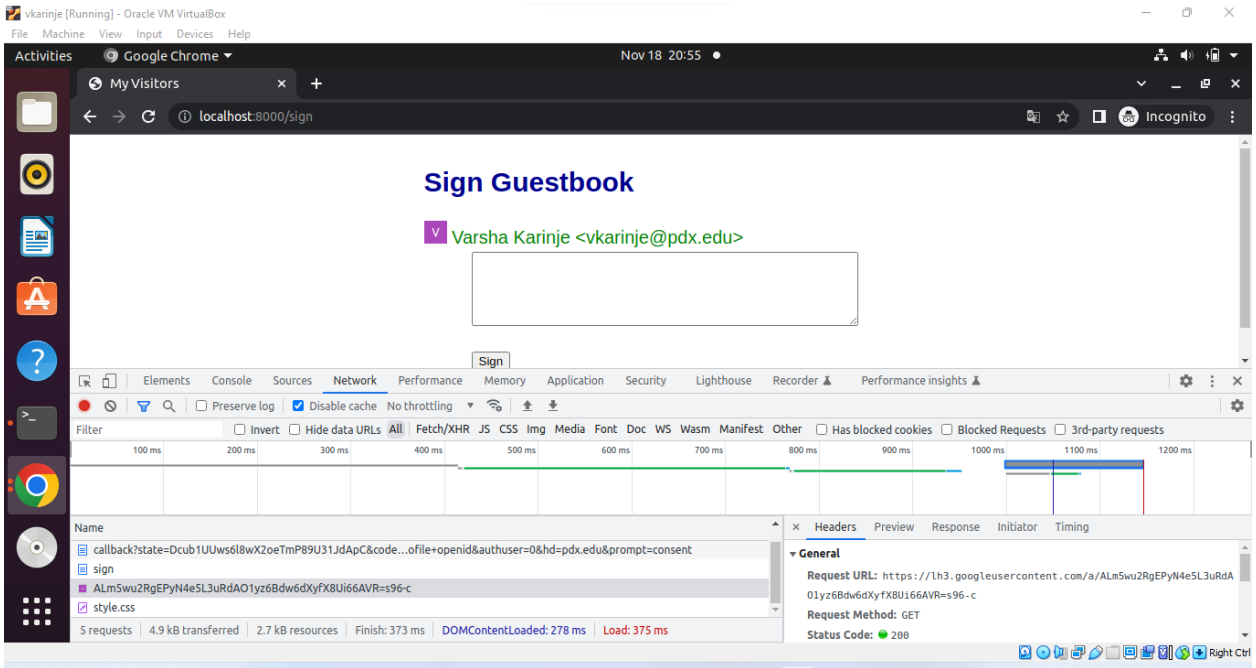


Running the code



- Take a screenshot of the Headers that includes the URL and the returned HTTP status code for each request for your lab notebook.



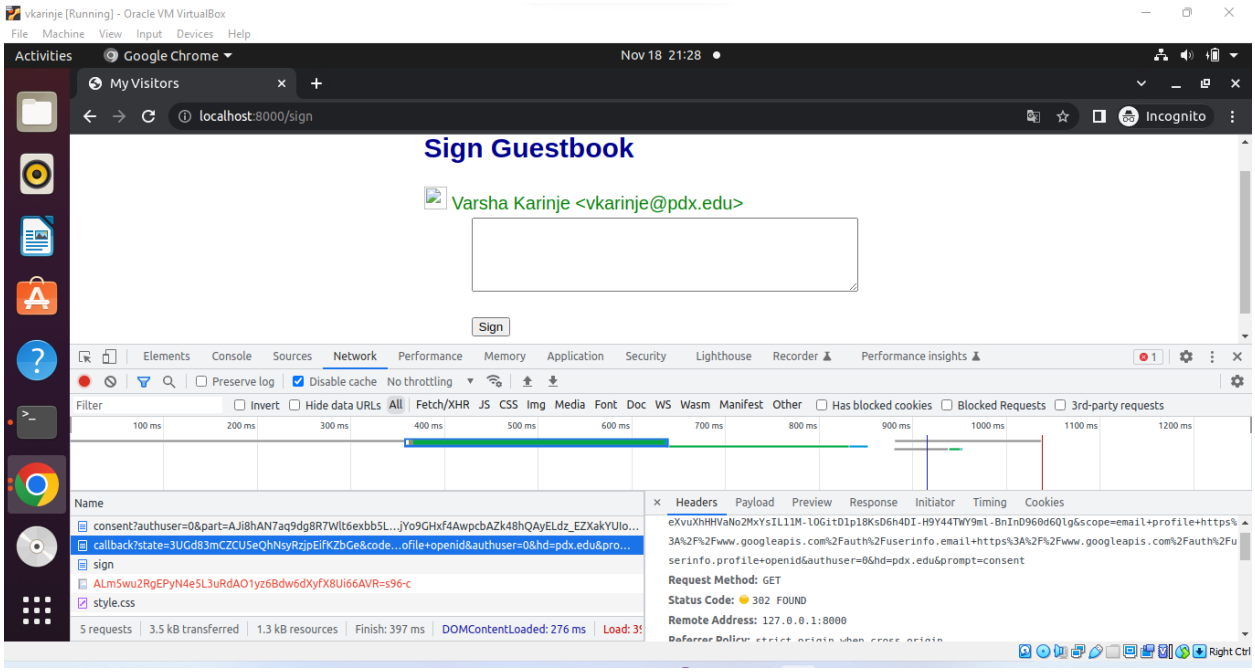


- Based on the description of the source code, what lines of code in our application are responsible for the second request?

Ans:

```
else:
# Redirect to the identity provider and ask the identity provider to return the client
#   back to /callback route with the code
    google = OAuth2Session(client_id,
            redirect_uri = 'http://localhost:8000/callback',
            scope = 'https://www.googleapis.com/auth/userinfo.email ' +
                    'https://www.googleapis.com/auth/userinfo.profile'
    )
    authorization_url, state = google.authorization_url(authorization_base_url)

    # Identity provider returns URL and random "state" that must be echoed later
    #   to prevent CSRF.
    session['oauth_state'] = state
    return redirect(authorization_url)
```

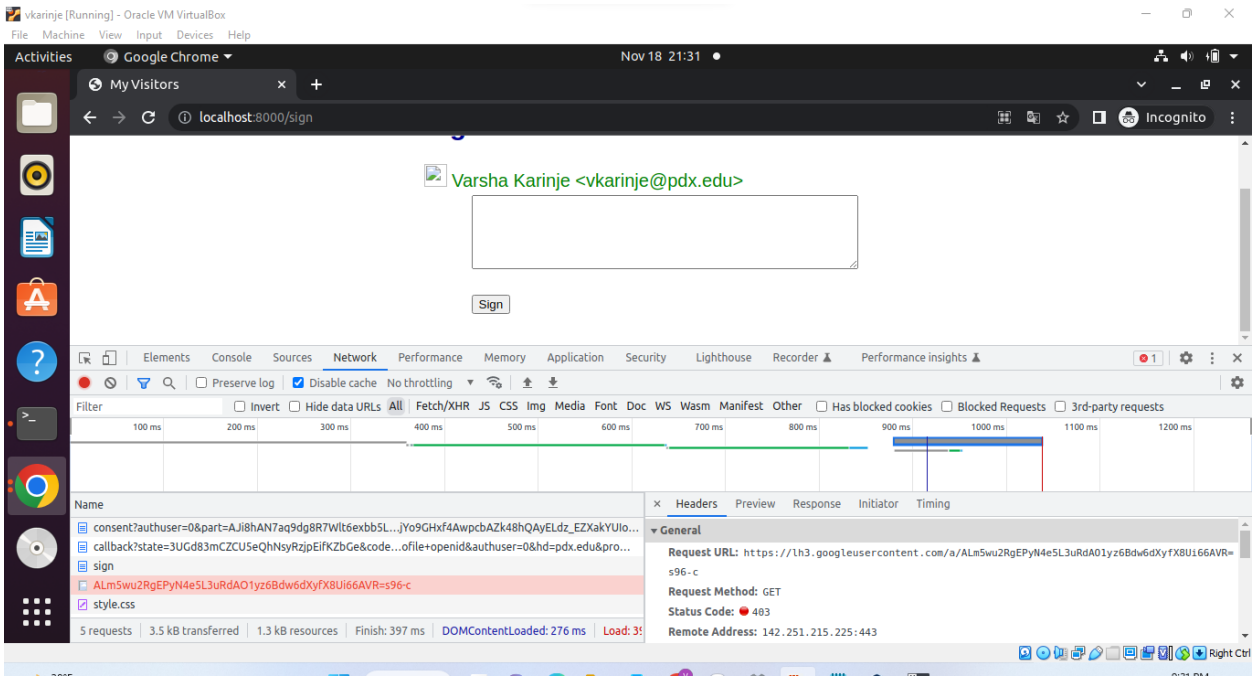
- Take a screenshot of the Headers that includes the entire Callback URL and its returned HTTP status code. What location is the User sent to as a result of this request?



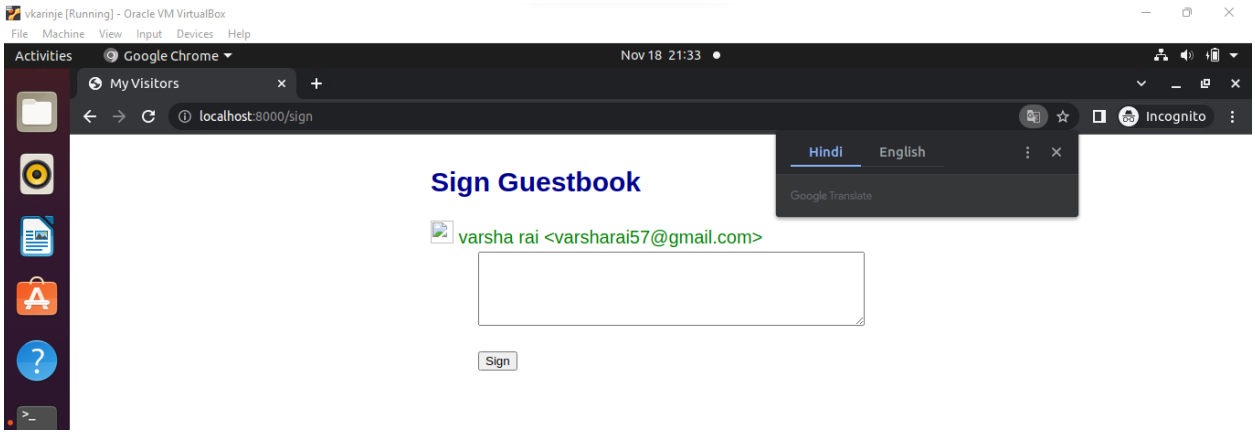
The user is sent back to the location http://localhost:8000/sign

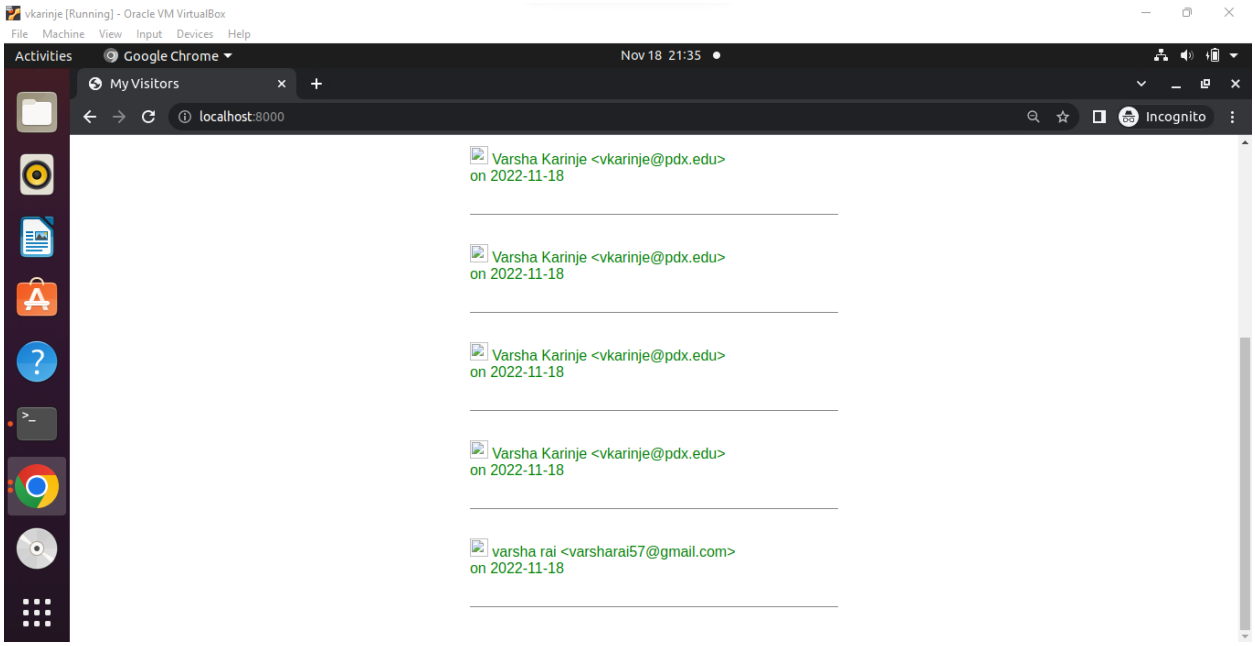
The status code returned is 302 FOUND

Find the request within Developer Tools that fetches the embedded image and take a screenshot of its URL

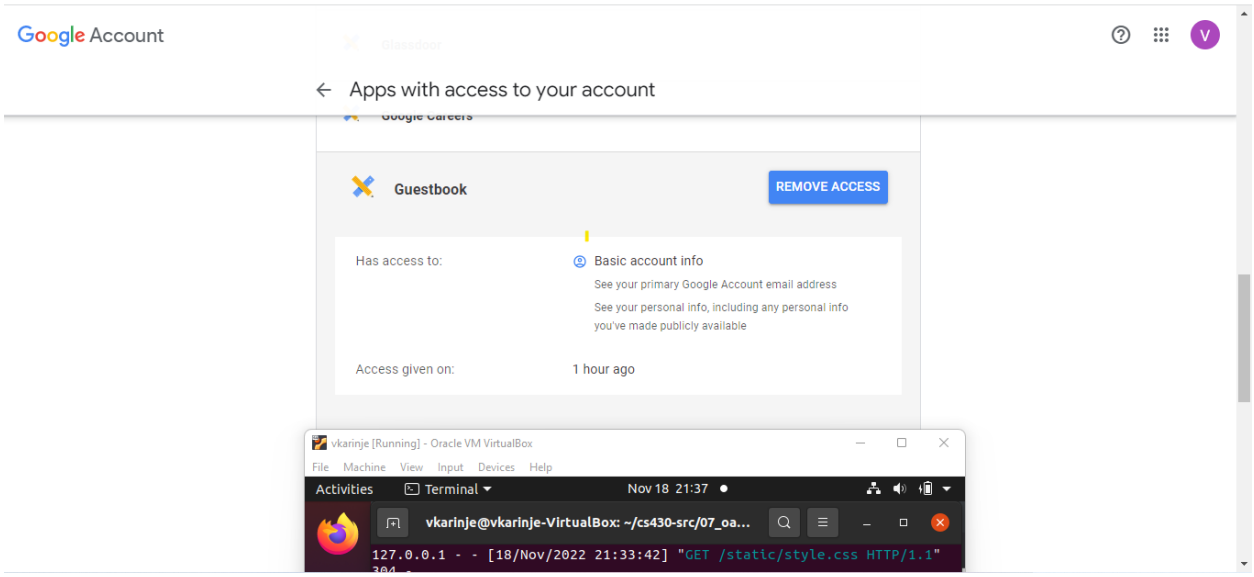


- Take a screenshot showing multiple authenticated accounts have been able to sign the Guestbook.



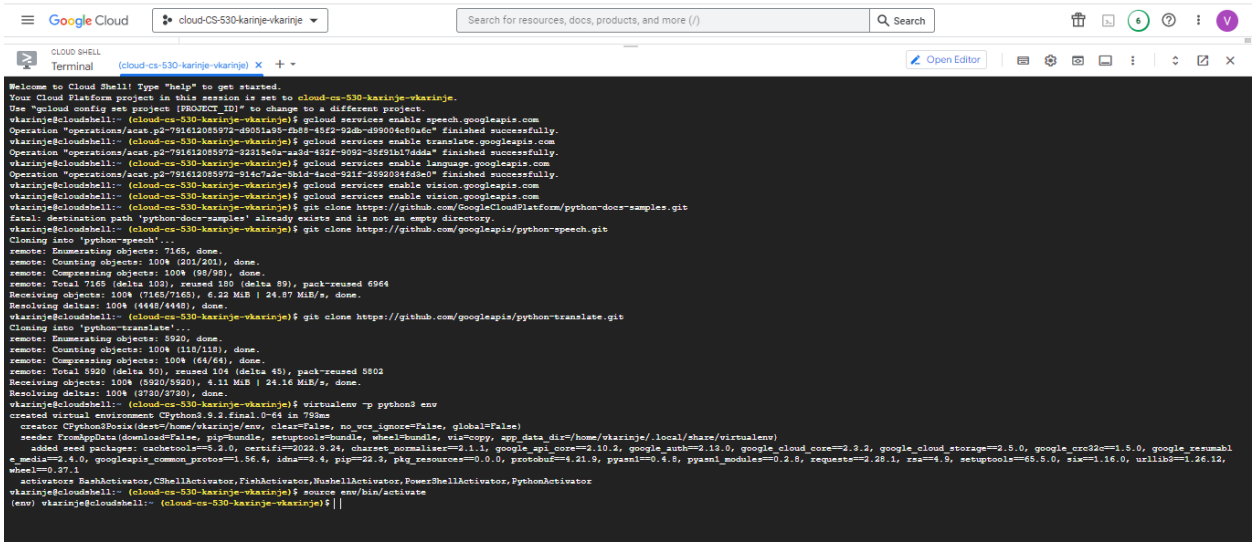


Removing access

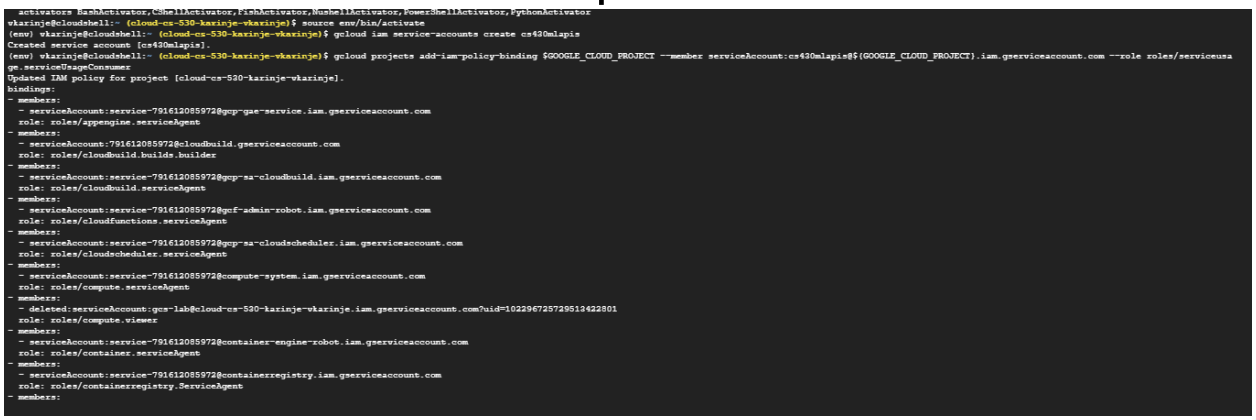


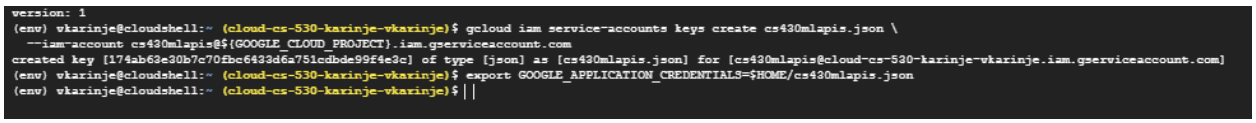
08.2g: ML APIs

APIs #1 (Vision, Speech, Translate, Natural Language APIs)



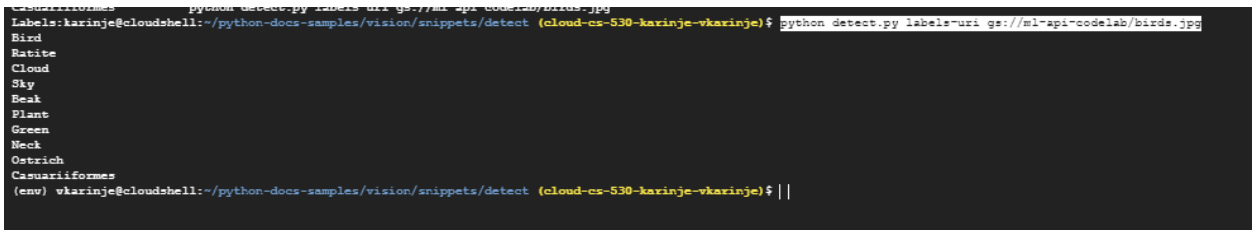
IAM service account setup





Vision

- Show the output for your lab notebook



Answer the following questions:

- What is the name of the function?

The name of the function is detect_labels_uri

- What type of Vision client is instantiated in it?

The type of Vision client that is instantiated in it is ImageAnnotatorClient

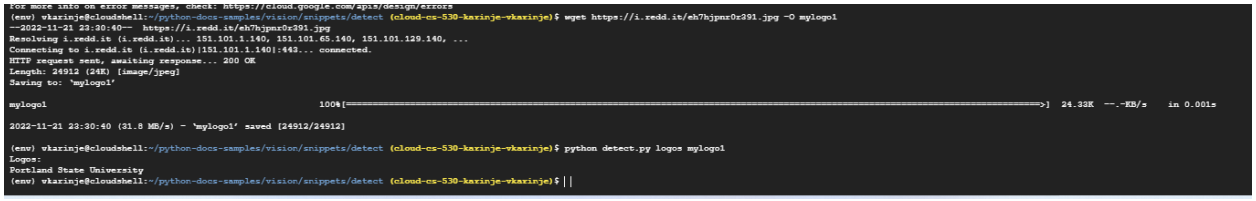
- What method is invoked in the Vision client to perform the detection?

The method that is invoked in the Vision client to perform the detection is label_detection

- What is the name of the attribute in the response object that contains the results we seek?

The name of the attribute in the response object that contains the results we seek is label_annotations

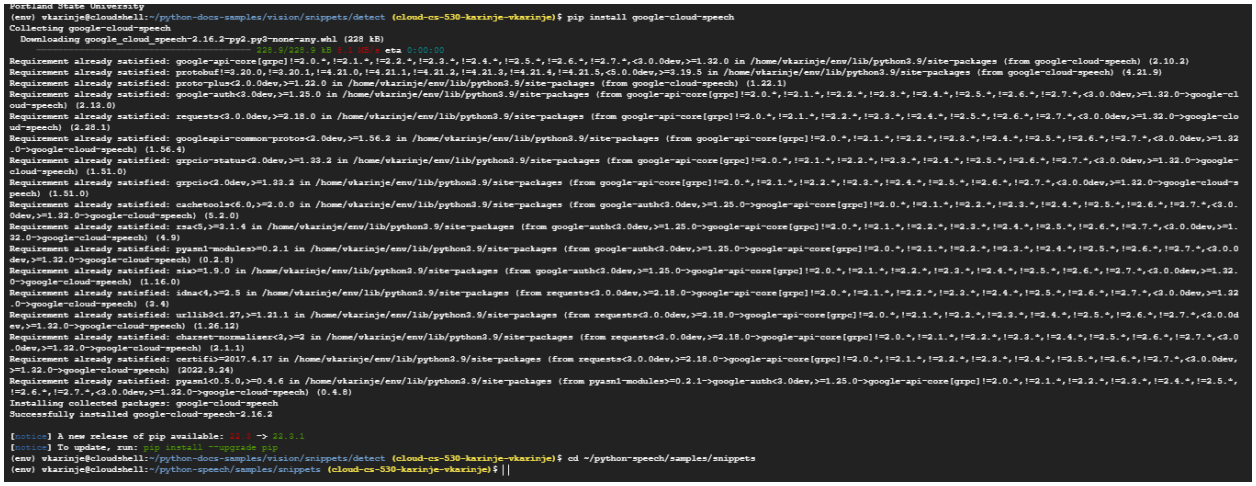
- Take a screenshot of the output for the above commands



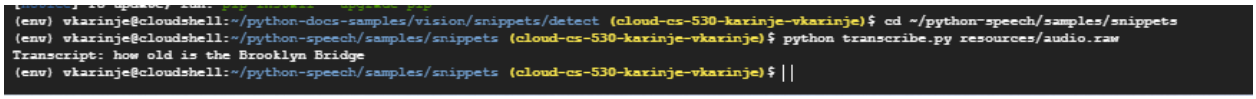
- What method is invoked in the Vision client to perform the detection?

detect_logos

Speech



- Show the output for your lab notebook



Answer the following questions:

- What is the name of the function?

transcribe_file is the name of the function.

- What method is invoked in the Speech client to perform the detection?

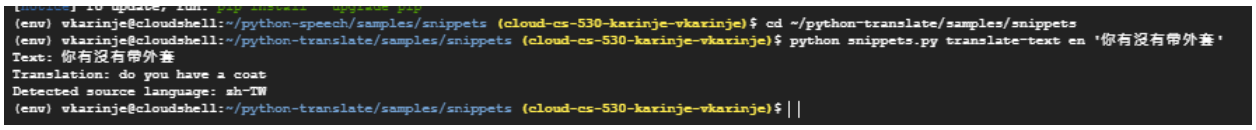
recognize method is invoked in the Speech client to perform the detection

- What is the name of the attribute in the response object that contains the results we seek?

result.alternatives[0].transcript is the name of the attribute in the response object that contains the results we seek

Translate

- Show the output for your lab notebook



Answer the following questions:

- What is the name of the function?

The name of the function is translate_text

- What method is invoked in the Translate client to perform the detection?

The method translate is invoked in the Translate client to perform the detection

- What is the name of the attribute in the response object that contains the results we seek?

input, translatedText, detectedSourceLanguage

```
print(u"Text: {}".format(result["input"]))
print(u"Translation: {}".format(result["translatedText"]))
print(u"Detected source language: {}".format(result["detectedSourceLanguage"]))
```

Natural Language

```
Detected source language: zh-TW
(env) vkarinje@cloudshell:~/python-translate/samples/snippets (cloud-cs-530-karinje-vkarinje)$ pip install google-cloud-language
Collecting google-cloud-language
  Downloading google_cloud_language-2.6.1-py2.py3-none-any.whl (84 kB)
     ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 84.6/84.6 kB 5.4 MB/s eta 0:00:00
Requirement already satisfied: google-api-core[grpc]!=2.0.*,!=2.1.*,!=2.2.*,!=2.3.*,!=2.4.*,!=2.5.*,!=2.6.*,!=2.7.*,<3.0.0dev,>=1.32.0 in /home/vkarinje/env/lib/python3.9/site-packages (from google-cloud-language) (2.10.2)
Requirement already satisfied: proto-plus<2.0.0dev,>=1.22.0 in /home/vkarinje/env/lib/python3.9/site-packages (from google-cloud-language) (1.22.1)
Requirement already satisfied: protobuf!=3.20.0,!=3.20.1,!=4.21.0,!=4.21.1,!=4.21.2,!=4.21.3,!=4.21.4,!=4.21.5,<5.0.0dev,>=3.19.5 in /home/vkarinje/env/lib/python3.9/site-packages (from google-cloud-language) (4.21.9)
Requirement already satisfied: googleapis-common-protos<2.0dev,>=1.56.2 in /home/vkarinje/env/lib/python3.9/site-packages (from google-api-core[grpc]!=2.0.*,!=2.1.*,!=2.2.*,!=2.3.*,!=2.4.*,!=2.5.*,!=2.6.*,!=2.7.*,<3.0.0dev,>=1.32
.0->google-cloud-language) (1.56.4)
Requirement already satisfied: google-auth<2.0dev,>=1.25.0 in /home/vkarinje/env/lib/python3.9/site-packages (from google-api-core[grpc]!=2.0.*,!=2.1.*,!=2.2.*,!=2.3.*,!=2.4.*,!=2.5.*,!=2.6.*,!=2.7.*,<3.0.0dev,>=1.32.0->google-cl
oud-language) (2.13.0)
Requirement already satisfied: requests<3.0.0dev,>=2.18.0 in /home/vkarinje/env/lib/python3.9/site-packages (from google-api-core[grpc]!=2.0.*,!=2.1.*,!=2.2.*,!=2.3.*,!=2.4.*,!=2.5.*,!=2.6.*,!=2.7.*,<3.0.0dev,>=1.32.0->google-clo
ud-language) (2.28.1)
Requirement already satisfied: grpcio<2.0dev,>=1.33.2 in /home/vkarinje/env/lib/python3.9/site-packages (from google-api-core[grpc]!=2.0.*,!=2.1.*,!=2.2.*,!=2.3.*,!=2.4.*,!=2.5.*,!=2.6.*,!=2.7.*,<3.0.0dev,>=1.32.0->google-cloud-l
anguage) (1.51.0)
Requirement already satisfied: grpcio-status<2.0dev,>=1.33.2 in /home/vkarinje/env/lib/python3.9/site-packages (from google-api-core[grpc]!=2.0.*,!=2.1.*,!=2.2.*,!=2.3.*,!=2.4.*,!=2.5.*,!=2.6.*,!=2.7.*,<3.0.0dev,>=1.32.0->google-
cloud-language) (1.51.0)
Requirement already satisfied: six>=1.9.0 in /home/vkarinje/env/lib/python3.9/site-packages (from google-auth<3.0dev,>=1.25.0->google-api-core[grpc]!=2.0.*,!=2.1.*,!=2.2.*,!=2.3.*,!=2.4.*,!=2.5.*,!=2.6.*,!=2.7.*,<3.0.0dev,>=1.32.
0->google-cloud-language) (1.16.0)
Requirement already satisfied: cachetools<6.0,>=2.0.0 in /home/vkarinje/env/lib/python3.9/site-packages (from google-auth<3.0dev,>=1.25.0->google-api-core[grpc]!=2.0.*,!=2.1.*,!=2.2.*,!=2.3.*,!=2.4.*,!=2.5.*,!=2.6.*,!=2.7.*,<3.0.
0dev,>=1.32.0->google-cloud-language) (5.2.0)
Requirement already satisfied: pyasn1-modules>=0.2.1 in /home/vkarinje/env/lib/python3.9/site-packages (from google-auth<3.0dev,>=1.25.0->google-api-core[grpc]!=2.0.*,!=2.1.*,!=2.2.*,!=2.3.*,!=2.4.*,!=2.5.*,!=2.6.*,!=2.7.*,<3.0.0
dev,>=1.32.0->google-cloud-language) (0.2.8)
Requirement already satisfied: rsa<5,>=3.1.4 in /home/vkarinje/env/lib/python3.9/site-packages (from google-auth<3.0dev,>=1.25.0->google-api-core[grpc]!=2.0.*,!=2.1.*,!=2.2.*,!=2.3.*,!=2.4.*,!=2.5.*,!=2.6.*,!=2.7.*,<3.0.0dev,>=1.
32.0->google-cloud-language) (4.9)
Requirement already satisfied: charset-normalizer<3,>=2 in /home/vkarinje/env/lib/python3.9/site-packages (from requests<3.0.0dev,>=2.18.0->google-api-core[grpc]!=2.0.*,!=2.1.*,!=2.2.*,!=2.3.*,!=2.4.*,!=2.5.*,!=2.6.*,!=2.7.*,<3.0
.0dev,>=1.32.0->google-cloud-language) (2.1.1)
Requirement already satisfied: certifi>=2017.4.17 in /home/vkarinje/env/lib/python3.9/site-packages (from requests<3.0.0dev,>=2.18.0->google-api-core[grpc]!=2.0.*,!=2.1.*,!=2.2.*,!=2.3.*,!=2.4.*,!=2.5.*,!=2.6.*,!=2.7.*,<3.0.0dev,
>=1.32.0->google-cloud-language) (2022.9.24)
Requirement already satisfied: urllib3<1.27,>=1.21.1 in /home/vkarinje/env/lib/python3.9/site-packages (from requests<3.0.0dev,>=2.18.0->google-api-core[grpc]!=2.0.*,!=2.1.*,!=2.2.*,!=2.3.*,!=2.4.*,!=2.5.*,!=2.6.*,!=2.7.*,<3.0.0d
ev,>=1.32.0->google-cloud-language) (1.26.12)
Requirement already satisfied: idna<4,>=2.5 in /home/vkarinje/env/lib/python3.9/site-packages (from requests<3.0.0dev,>=2.18.0->google-api-core[grpc]!=2.0.*,!=2.1.*,!=2.2.*,!=2.3.*,!=2.4.*,!=2.5.*,!=2.6.*,!=2.7.*,<3.0.0dev,>=1.32
.0->google-cloud-language) (3.4)
Requirement already satisfied: pyasn1<0.5.0,>=0.4.6 in /home/vkarinje/env/lib/python3.9/site-packages (from pyasn1-modules>=0.2.1->google-auth<3.0dev,>=1.25.0->google-api-core[grpc]!=2.0.*,!=2.1.*,!=2.2.*,!=2.3.*,!=2.4.*,!=2.5.*,
!=2.6.*,!=2.7.*,<3.0.0dev,>=1.32.0->google-cloud-language) (0.4.8)
Installing collected packages: google-cloud-language
Successfully installed google-cloud-language-2.6.1

[notice] A new release of pip available: 22.2 -> 22.3.1
[notice] To update, run: pip install --upgrade pip
(env) vkarinje@cloudshell:~/python-translate/samples/snippets (cloud-cs-530-karinje-vkarinje)$
```

```
(env) vkarinje@cloudshell:~/python-translate/samples/snippets (cloud-cs-530-karinje-vkarinje)$ vi language.py
(env) vkarinje@cloudshell:~/python-translate/samples/snippets (cloud-cs-530-karinje-vkarinje)$ cat language.py
from google.cloud import language
import sys

client = language.LanguageServiceClient()

text = sys.argv[1]

request = {'document' : {"type_": language.Document.Type.PLAIN_TEXT, "content": text}}

sentiment = client.analyze_sentiment(request).document_sentiment
entities = client.analyze_entities(request).entities

print(f'"{text}" has sentiment={sentiment.score}\n')

print("Entities are:")
for entity in entities:
    print(f'name: {entity.name}')
(env) vkarinje@cloudshell:~/python-translate/samples/snippets (cloud-cs-530-karinje-vkarinje)$
```

- Show the output for your lab notebook

```
    print(f'name: {entity.name}')
(env) vkarinje@cloudshell:~/python-translate/samples/snippets (cloud-cs-530-karinje-vkarinje)$ python language.py 'homework is awful!'
"homework is awful!" has sentiment=-0.800000011920929

Entities are:
name: homework
(env) vkarinje@cloudshell:~/python-translate/samples/snippets (cloud-cs-530-karinje-vkarinje)$ python language.py 'homework is ok'
"homework is ok" has sentiment=0.30000001192092896

Entities are:
name: homework
(env) vkarinje@cloudshell:~/python-translate/samples/snippets (cloud-cs-530-karinje-vkarinje)$ python language.py 'homework is awesome?'
"homework is awesome?" has sentiment=0.4000000059604645

Entities are:
name: homework
(env) vkarinje@cloudshell:~/python-translate/samples/snippets (cloud-cs-530-karinje-vkarinje)$ python language.py 'homework is awesome!'
"homework is awesome!" has sentiment=0.8999999761581421

Entities are:
name: homework
(env) vkarinje@cloudshell:~/python-translate/samples/snippets (cloud-cs-530-karinje-vkarinje)$ python language.py 'The protestors in Oregon put on gas masks and wore yellow t-shirts'
"The protestors in Oregon put on gas masks and wore yellow t-shirts" has sentiment=-0.6000000238418579

Entities are:
name: protestors
name: gas masks
name: Oregon
name: t-shirts
(env) vkarinje@cloudshell:~/python-translate/samples/snippets (cloud-cs-530-karinje-vkarinje)$
```

Code

```
(env) vkarinje@cloudshell:~/python-translate/samples/snippets (cloud-cs-530-karinje-vkarinje)$ vi solution.py
(env) vkarinje@cloudshell:~/python-translate/samples/snippets (cloud-cs-530-karinje-vkarinje)$ cat solution.py
import argparse
from google.cloud import vision
from google.cloud import speech
from google.cloud import translate_v2 as translate
from google.cloud import language
import six

def detect_labels_uri(uri):
    """Detects labels in the file located in Google Cloud Storage or on the
    Web."""

    # create ImageAnnotatorClient object
    client = vision.ImageAnnotatorClient()

    # create Image object
    image = vision.Image()

    # specify location of image
    image.source.image_uri = uri

    # get label_detection response by passing image to client
    response = client.label_detection(image=image)

    # get label_annotations portion of response
    labels = response.label_annotations

    # we only need the label descriptions
    label_descriptions = []
    for label in labels:
        label_descriptions.append(label.description)

    return label_descriptions

def transcribe_gcs(language, gcs_uri):
    """Transcribes the audio file specified by the gcs_uri."""

    # create ImageAnnotatorClient object
    client = speech.SpeechClient()

    # specify location of speech
    audio = speech.RecognitionAudio(uri=gcs_uri) # need to specify speech.types
```

Examine the code and answer the following questions:

- What is the name of the function that performs the transcription?

  Ans: The name of the function that performs the transcription is transcribe_gcs

- What is the name of the function that performs the translation?

  Ans: The name of the function that performs the translation is translate_text

- What is the name of the function that performs the entity analysis on the translation?

  Ans: The name of the function that performs the entity analysis on the translation is entities_text

- What is the name of the function that performs the entity analysis on the image?

  Ans: label_detection

Test integration

```
(env) vkarinje@cloudshell:~/python-translate/samples/snippets (cloud-cs-530-karinje-vkarinje)$ python solution.py de-DE gs://ml-api-codelab/de-ball.wav gs://ml-api-codelab/football.jpg
Transcription: willst du mit uns Fußball spielen
Translation: do you want to play soccer with us
Entities: ['soccer']
Image labels: ['Sports equipment', 'Soccer', 'Football', 'Plant', 'Ball', 'Player', 'Playing sports', 'Soccer ball', 'Ball game', 'Team sport']
The audio and image do not appear to be related.
(env) vkarinje@cloudshell:~/python-translate/samples/snippets (cloud-cs-530-karinje-vkarinje)$
```

- If the program deems them unrelated, then based on the results from the APIs, what must be changed in the program to address this?

Ans: The program is case sensitive while checking for entities and labels. The program must be made case insensitive to make sure that the comparison is matched.

```
(env) vkarinje@cloudshell:~/python-translate/samples/snippets (cloud-cs-530-karinje-vkarinje)$ python solution.py tr-TR gs://ml-api-codelab/tr-bike.wav gs://ml-api-codelab/bicycle.jpg
Transcription: bisikletimi sokağa bırak
Translation: leave my bike on the street
Entities: ['bike', 'street']
Image labels: ['Bicycle', 'Clothing', 'Footwear', 'Tire', 'Wheel', 'Bicycles--Equipment and supplies', 'Land vehicle', 'Shoe', 'Bicycle frame', 'Bicycle wheel']
The audio and image do not appear to be related.
(env) vkarinje@cloudshell:~/python-translate/samples/snippets (cloud-cs-530-karinje-vkarinje)$
```

- If the program deems them unrelated, then based on the results from the APIs, what must be changed in the program to address this?

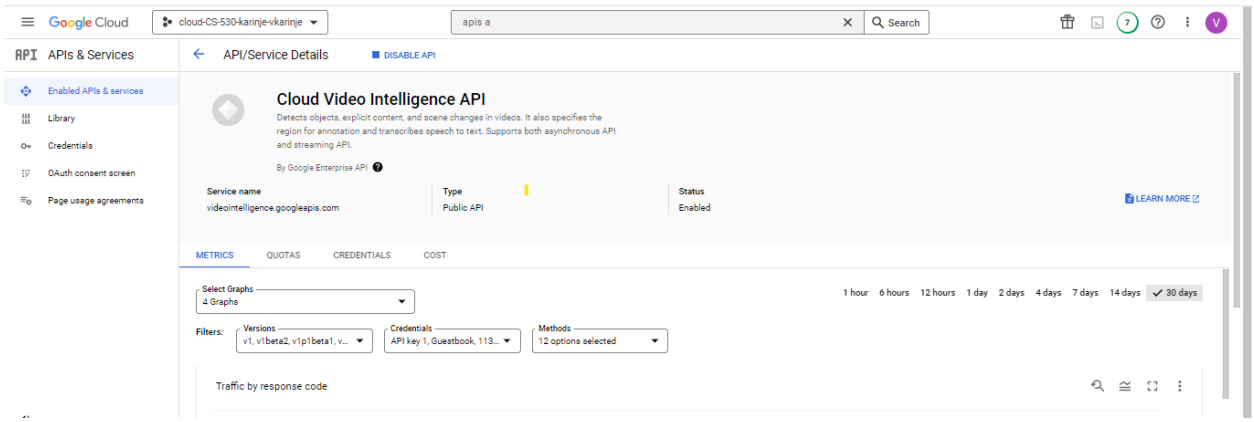
Ans: The program seems to be working fine. The translation returns bike and street. The labels contain words like bicycle and nothing relates to street.Hence, no tags match.

```
The audio and image do not appear to be related.
(env) vkarinje@cloudshell:~/python-translate/samples/snippets (cloud-cs-530-karinje-vkarinje)$ python solution.py tr-TR gs://ml-api-codelab/tr-ostrich.wav gs://ml-api-codelab/birds.jpg
Transcription: çok fazla deve kuşu var
Translation: there are too many ostriches
Entities: ['ostriches']
Image labels: ['Bird', 'Ratite', 'Cloud', 'Sky', 'Beak', 'Plant', 'Green', 'Neck', 'Ostrich', 'Casuariiformes']
The audio and image do not appear to be related.
(env) vkarinje@cloudshell:~/python-translate/samples/snippets (cloud-cs-530-karinje-vkarinje)$
```

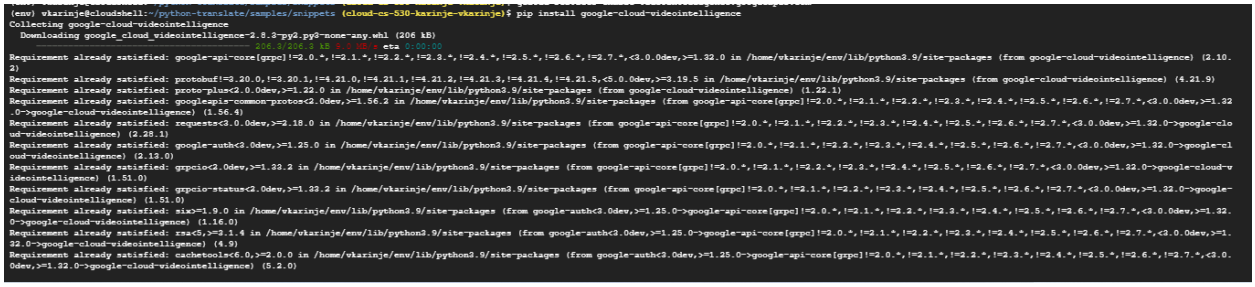
- If the program deems them unrelated, then based on the results from the APIs, what must be changed in the program to address this?

Ans: The program returns singular and plural words and not the exact matches. For entities Ostriches the label Ostrich is returned. A method that matches the comparisons entities and labels while comparing even if the entity is case-sensitive or singular/plural can be added.

APIs #2 (Video Intelligence API)



Video setup



```
[notice] A new release of pip available: 22.3 -> 22.3.1
[notice] To update, run: pip install --upgrade pip
(env) vkarinje@cloudshell:~/python-translate/samples/snippets (cloud-cs-530-karinje-vkarinje)$ gsutil mb gs://vkarinje-bucket
Creating gs://vkarinje-bucket/...
(env) vkarinje@cloudshell:~/python-translate/samples/snippets (cloud-cs-530-karinje-vkarinje)$ export CLOUD_STORAGE_BUCKET=vkarinje-bucket
(env) vkarinje@cloudshell:~/python-translate/samples/snippets (cloud-cs-530-karinje-vkarinje)$ gsutil acl set public-read gs://${CLOUD_STORAGE_BUCKET}
Setting ACL on gs://vkarinje-bucket/...
(env) vkarinje@cloudshell:~/python-translate/samples/snippets (cloud-cs-530-karinje-vkarinje)$ gsutil defacl set public-read gs://${CLOUD_STORAGE_BUCKET}
Setting default object ACL on gs://vkarinje-bucket/...
(env) vkarinje@cloudshell:~/python-translate/samples/snippets (cloud-cs-530-karinje-vkarinje)$
```

```
(env) vkarinje@cloudshell:~/python-translate/samples/snippets (cloud-cs-530-karinje-vkarinje)$ curl https://shefengs.com/wuchang/courses/cs420/SportsBloopers2016.mp4 | gsutil -h "Content-Type:video/mp4" cp - gs://${CLOUD_STORAGE_
BUCKET}/SportsBloopers2016.mp4
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left  Speed
  0     0    0     0    0     0      0      0 --:--:-- --:--:-- --:--:--     0Copying from <STDIN> [Content-Type=video/mp4]...
100 47.7M  100 47.7M    0     0  20.9M      0  0:00:02  0:00:02 --:--:-- 20.9M
/ [1 files][    0.0 B/    0.0 B]
Operation completed over 1 objects.
(env) vkarinje@cloudshell:~/python-translate/samples/snippets (cloud-cs-530-karinje-vkarinje)$
```

Video Intelligence labeling script

```
(env) vkarinje@cloudshell:~/python-translate/samples/snippets (cloud-cs-530-karinje-vkarinje)$ vi labels.py
(env) vkarinje@cloudshell:~/python-translate/samples/snippets (cloud-cs-530-karinje-vkarinje)$ cat labels.py
import argparse

from google.cloud import videointelligence

def analyze_labels(path):
    """ Detects labels given a GCS path. """
    video_client = videointelligence.VideoIntelligenceServiceClient()
    features = [videointelligence.Feature.LABEL_DETECTION]
    operation = video_client.annotate_video(input_uri=path, features=features)

    print('\nProcessing video for label annotations:')
    result = operation.result(timeout=90)
    print('\nFinished processing.')

    segment_labels = result.annotation_results[0].segment_label_annotations
    for i, segment_label in enumerate(segment_labels):
        print('Video label description: {}'.format(
            segment_label.entity.description))
        for category_entity in segment_label.category_entities:
            print('\tLabel category description: {}'.format(
                category_entity.description))

        for i, segment in enumerate(segment_label.segments):
            start_time = segment.segment.start_time_offset.seconds
            end_time = segment.segment.end_time_offset.seconds
            positions = '{}s to {}s'.format(start_time, end_time)
            confidence = segment.confidence
            print('\tSegment {}: {}'.format(i, positions))
            print('\tConfidence: {}'.format(confidence))
        print('\n')
```

Video Intelligence

```
    analyze_labels(args.path)
(env) vkarinje@cloudshell:~/python-translate/samples/snippets (cloud-cs-530-karinje-vkarinje)$ python labels.py gs://${CLOUD_STORAGE_BUCKET}/SportsBloopers2016.mp4

Processing video for label annotations:

Finished processing.
Video label description: player
        Segment 0: 0s to 178s
        Confidence: 0.8446521162986755


Video label description: hockey
        Label category description: sports
        Segment 0: 0s to 178s
        Confidence: 0.3119717538356781


Video label description: stadium
        Label category description: location
        Label category description: structure
        Segment 0: 0s to 178s
        Confidence: 0.5119114518165588


Video label description: basketball player
        Label category description: person
        Segment 0: 0s to 178s
        Confidence: 0.3539550006389618


Video label description: ice hockey
        Label category description: hockey
        Segment 0: 0s to 178s
        Confidence: 0.42565470933914185


Video label description: ball game
        Label category description: sports
        Segment 0: 0s to 178s
        Confidence: 0.5648892521858215


Video label description: audience
```

CLOUD SHELL
Terminal
(cloud-cs-530-karinje-vkarinje)
Video label description: ball game
Label category description: sports
Segment 0: 0s to 178s
Confidence: 0.5648892521858215
Video label description: audience
Label category description: people
Segment 0: 0s to 178s
Confidence: 0.4254549741744995
Video label description: games
Segment 0: 0s to 178s
Confidence: 0.7786175012588501
Video label description: team sport
Label category description: sports
Segment 0: 0s to 178s
Confidence: 0.688680112361908
Video label description: sport venue
Label category description: location
Label category description: structure
Segment 0: 0s to 178s
Confidence: 0.3432130515575409
Video label description: crowd
Label category description: people
Segment 0: 0s to 178s
Confidence: 0.3974151611328125
Video label description: basketball
Label category description: sports
Segment 0: 0s to 178s
Confidence: 0.9137870669364929

```
Video label description: sport venue
        Label category description: location
        Label category description: structure
        Segment 0: 0s to 178s
        Confidence: 0.3432130515575409


Video label description: crowd
        Label category description: people
        Segment 0: 0s to 178s
        Confidence: 0.3974151611328125


Video label description: basketball
        Label category description: sports
        Segment 0: 0s to 178s
        Confidence: 0.9137870669364929


Video label description: sports
        Segment 0: 0s to 178s
        Confidence: 0.9218811392784119
```

Answer the following for your lab notebook.

- What are the top 3 labels that the Video Intelligence API associates with the video and what is its confidence in them?

Ans: The top 3 labels are player, basketball and sports. The confidence in them is 0.8, 0.91 and 0.92 respectively.

```
Finished processing.
Video label description: player
        Segment 0: 0s to 178s
        Confidence: 0.8446521162986755
```

```
Video label description: basketball
        Label category description: sports
        Segment 0: 0s to 178s
        Confidence: 0.9137870669364929


Video label description: sports
        Segment 0: 0s to 178s
        Confidence: 0.9218811392784119
```

Answer the following questions:

- What is the name of the client class in the package that is used?

  Ans: VideoIntelligenceServiceClient

- What method is used in that class to perform the annotation?

  Ans: annotate_video

APIs #3 (Web site integration)

```
(env) vkarinje@cloudshell:~/python-translate/samples/snippets (cloud-cs-530-karinje-vkarinje)$ cd ~/python-docs-samples/codelabs/flex_and_vision
(env) vkarinje@cloudshell:~/python-docs-samples/codelabs/flex_and_vision (cloud-cs-530-karinje-vkarinje)$
```

IAM service account setup

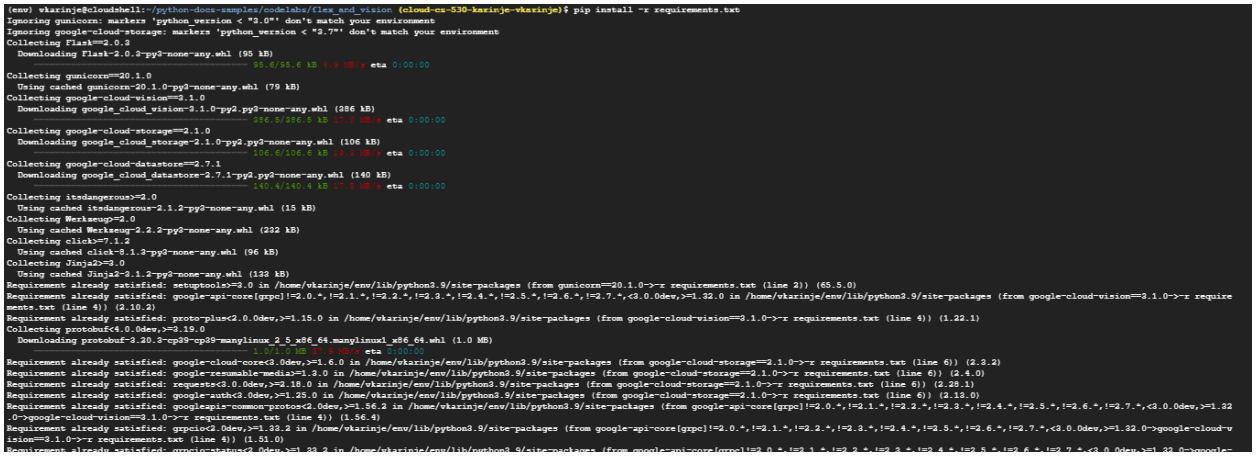
```
(env) vkarinje@cloudshell:~/python-docs-samples/codelabs/flex_and_vision (cloud-cs-530-karinje-vkarinje)$ gcloud iam service-accounts create cs430flex
Created service account [cs430flex].
(env) vkarinje@cloudshell:~/python-docs-samples/codelabs/flex_and_vision (cloud-cs-530-karinje-vkarinje)$ gcloud projects add-iam-policy-binding ${GOOGLE_CLOUD_PROJECT} --member serviceAccount:cs430flex@${GOOGLE_CLOUD_PROJECT}.ia
m.gserviceaccount.com --role roles/storage.admin
Updated IAM policy for project [cloud-cs-530-karinje-vkarinje].
bindings:
- members:
  - serviceAccount:service-791612085972@gcp-gae-service.iam.gserviceaccount.com
  role: roles/appengine.serviceAgent
- members:
  - serviceAccount:791612085972@cloudbuild.gserviceaccount.com
  role: roles/cloudbuild.builds.builder
- members:
  - serviceAccount:service-791612085972@gcp-sa-cloudbuild.iam.gserviceaccount.com
  role: roles/cloudbuild.serviceAgent
- members:
  - serviceAccount:service-791612085972@gcf-admin-robot.iam.gserviceaccount.com
  role: roles/cloudfunctions.serviceAgent
- members:
  - serviceAccount:service-791612085972@gcp-sa-cloudscheduler.iam.gserviceaccount.com
  role: roles/cloudscheduler.serviceAgent
- members:
  - serviceAccount:service-791612085972@compute-system.iam.gserviceaccount.com
  role: roles/compute.serviceAgent
- members:
  - deleted:serviceAccount:gcs-lab@cloud-cs-530-karinje-vkarinje.iam.gserviceaccount.com?uid=102296725729513422801
  role: roles/compute.viewer
- members:
```

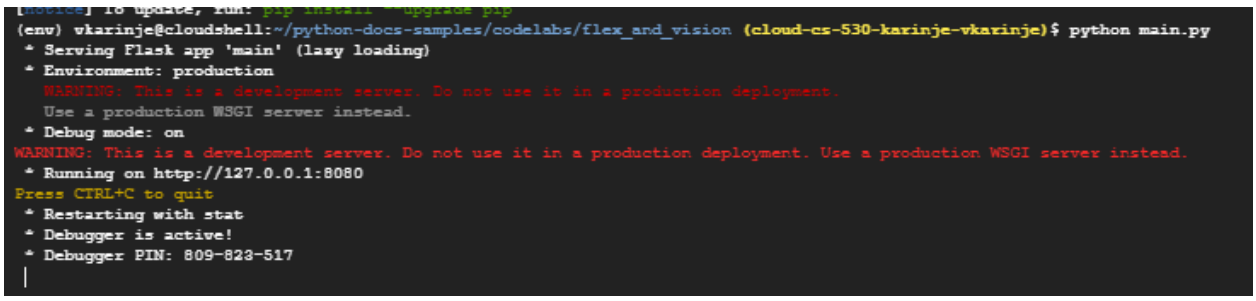
```
(env) vkarinje@cloudshell:~/python-docs-samples/codelabs/flex_and_vision (cloud-cs-530-karinje-vkarinje)$ gcloud projects add-iam-policy-binding ${GOOGLE_CLOUD_PROJECT} --member serviceAccount:cs430flex@${GOOGLE_CLOUD_PROJECT}.ia
m.gserviceaccount.com --role roles/datastore.user
Updated IAM policy for project [cloud-cs-530-karinje-vkarinje].
bindings:
- members:
  - serviceAccount:service-791612085972@gcp-gae-service.iam.gserviceaccount.com
  role: roles/appengine.serviceAgent
- members:
  - serviceAccount:791612085972@cloudbuild.gserviceaccount.com
  role: roles/cloudbuild.builds.builder
- members:
  - serviceAccount:service-791612085972@gcp-sa-cloudbuild.iam.gserviceaccount.com
  role: roles/cloudbuild.serviceAgent
- members:
  - serviceAccount:service-791612085972@gcf-admin-robot.iam.gserviceaccount.com
  role: roles/cloudfunctions.serviceAgent
- members:
  - serviceAccount:service-791612085972@gcp-sa-cloudscheduler.iam.gserviceaccount.com
  role: roles/cloudscheduler.serviceAgent
- members:
  - serviceAccount:service-791612085972@compute-system.iam.gserviceaccount.com
  role: roles/compute.serviceAgent
- members:
  - deleted:serviceAccount:gcs-lab@cloud-cs-530-karinje-vkarinje.iam.gserviceaccount.com?uid=102296725729513422801
  role: roles/compute.viewer
- members:
  - serviceAccount:service-791612085972@container-engine-robot.iam.gserviceaccount.com
  role: roles/container.serviceAgent
- members:
  - serviceAccount:service-791612085972@containerregistry.iam.gserviceaccount.com
  role: roles/containerregistry.ServiceAgent
- members:
  - serviceAccount:cloud-cs-530-karinje-vkarinje@appspot.gserviceaccount.com
  - serviceAccount:cs430flex@cloud-cs-530-karinje-vkarinje.iam.gserviceaccount.com
  - serviceAccount:guestbook@cloud-cs-530-karinje-vkarinje.iam.gserviceaccount.com
  role: roles/datastore.user
- members:
  - serviceAccount:791612085972-compute@developer.gserviceaccount.com
```

```
(env) vkarinje@cloudshell:~/python-docs-samples/codelabs/flex_and_vision (cloud-cs-530-karinje-vkarinje)$ gcloud projects add-iam-policy-binding $GOOGLE_CLOUD_PROJECT --member serviceAccount:cs430flex@${GOOGLE_CLOUD_PROJECT}.iam.
gserviceaccount.com --role roles/serviceusage.serviceUsageConsumer
Updated IAM policy for project [cloud-cs-530-karinje-vkarinje].
bindings:
- members:
  - serviceAccount:service-791612085972@gcp-gae-service.iam.gserviceaccount.com
  role: roles/appengine.serviceAgent
- members:
  - serviceAccount:791612085972@cloudbuild.gserviceaccount.com
  role: roles/cloudbuild.builds.builder
- members:
  - serviceAccount:service-791612085972@gcp-sa-cloudbuild.iam.gserviceaccount.com
  role: roles/cloudbuild.serviceAgent
- members:
  - serviceAccount:service-791612085972@gcf-admin-robot.iam.gserviceaccount.com
  role: roles/cloudfunctions.serviceAgent
- members:
  - serviceAccount:service-791612085972@gcp-sa-cloudscheduler.iam.gserviceaccount.com
  role: roles/cloudscheduler.serviceAgent
- members:
  - serviceAccount:service-791612085972@compute-system.iam.gserviceaccount.com
  role: roles/compute.serviceAgent
- members:
  - deleted:serviceAccount:gcs-lab@cloud-cs-530-karinje-vkarinje.iam.gserviceaccount.com?uid=102296725729513422801
  role: roles/compute.viewer
- members:
  - serviceAccount:service-791612085972@container-engine-robot.iam.gserviceaccount.com
  role: roles/container.serviceAgent
- members:
  - serviceAccount:service-791612085972@containerregistry.iam.gserviceaccount.com
  role: roles/containerregistry.ServiceAgent
- members:
  - serviceAccount:cloud-cs-530-karinje-vkarinje@appspot.gserviceaccount.com
  - serviceAccount:cs430flex@cloud-cs-530-karinje-vkarinje.iam.gserviceaccount.com
  - serviceAccount:guestbook@cloud-cs-530-karinje-vkarinje.iam.gserviceaccount.com
  role: roles/datastore.user
- members:
  - serviceAccount:791612085972-compute@developer.gserviceaccount.com
  - serviceAccount:791612085972@cloudservices.gserviceaccount.com
  role: roles/editor
- members:
  - serviceAccount:service-791612085972@firebase-rules.iam.gserviceaccount.com
  role: roles/firebaserules.system
- members:
```

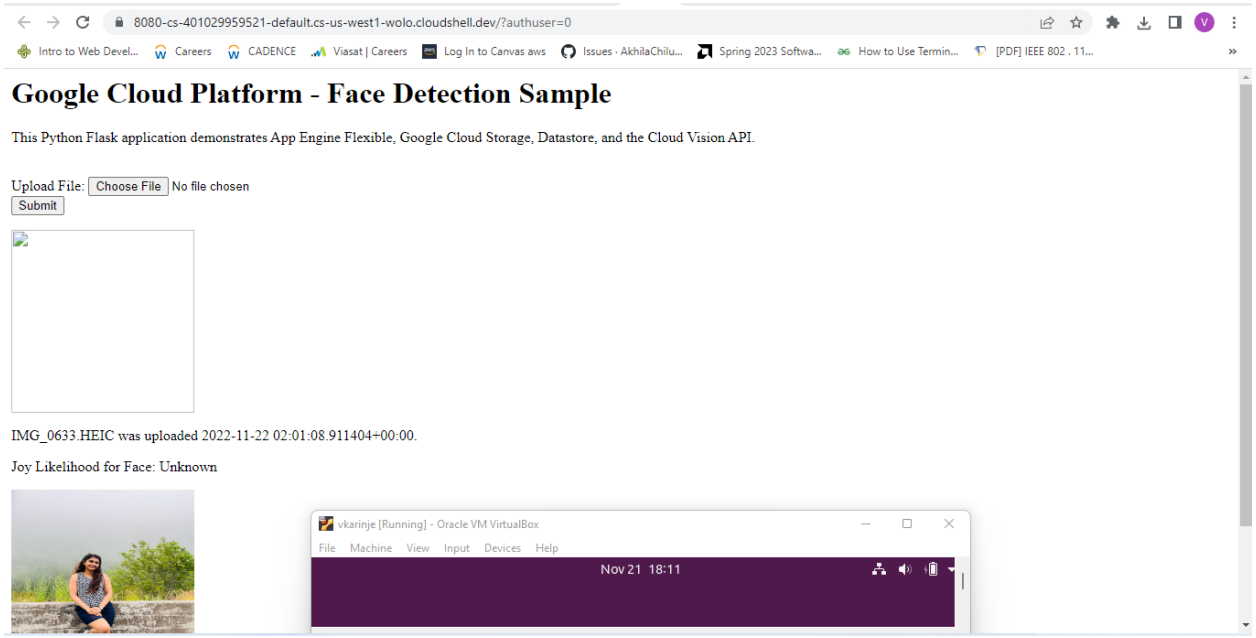
```
(env) vkarinje@cloudshell:~/python-docs-samples/codelabs/flex_and_vision (cloud-cs-530-karinje-vkarinje)$ gcloud iam service-accounts keys create ~/cs430flex.json \
  --iam-account cs430flex@${GOOGLE_CLOUD_PROJECT}.iam.gserviceaccount.com
created key [c71e029f3326bb0ac541308582ae58ec28c47ab3] of type [json] as [/home/vkarinje/cs430flex.json] for [cs430flex@cloud-cs-530-karinje-vkarinje.iam.gserviceaccount.com]
(env) vkarinje@cloudshell:~/python-docs-samples/codelabs/flex_and_vision (cloud-cs-530-karinje-vkarinje)$
```

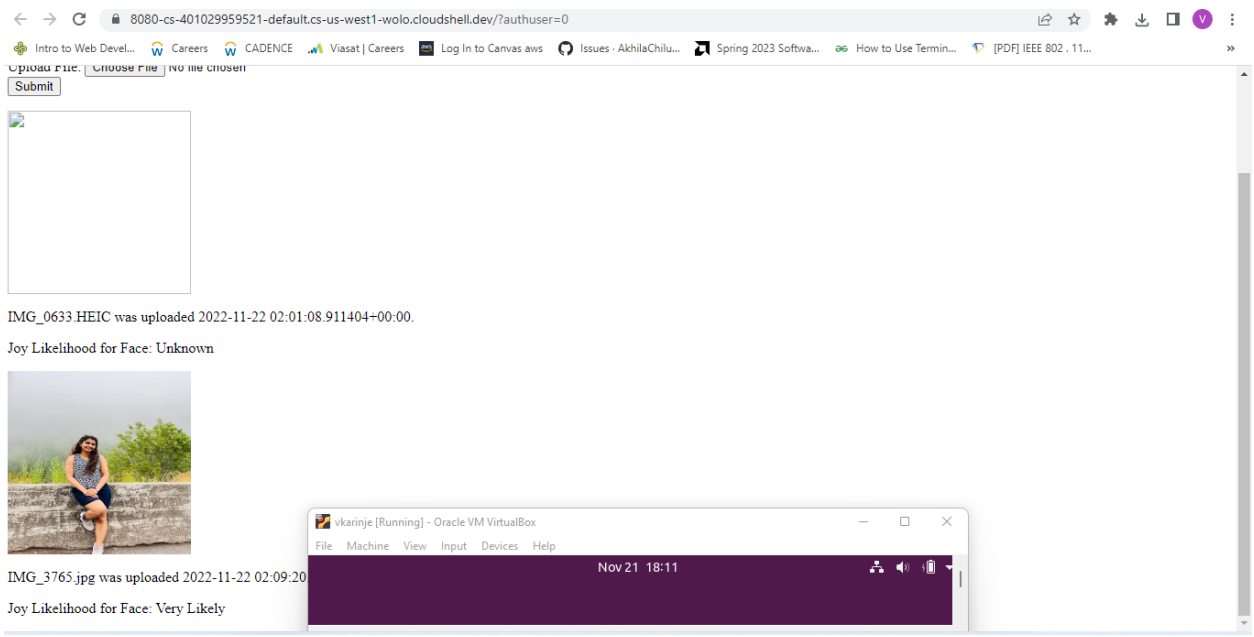
Application





- Take a screenshot for your lab notebook that includes the URL.

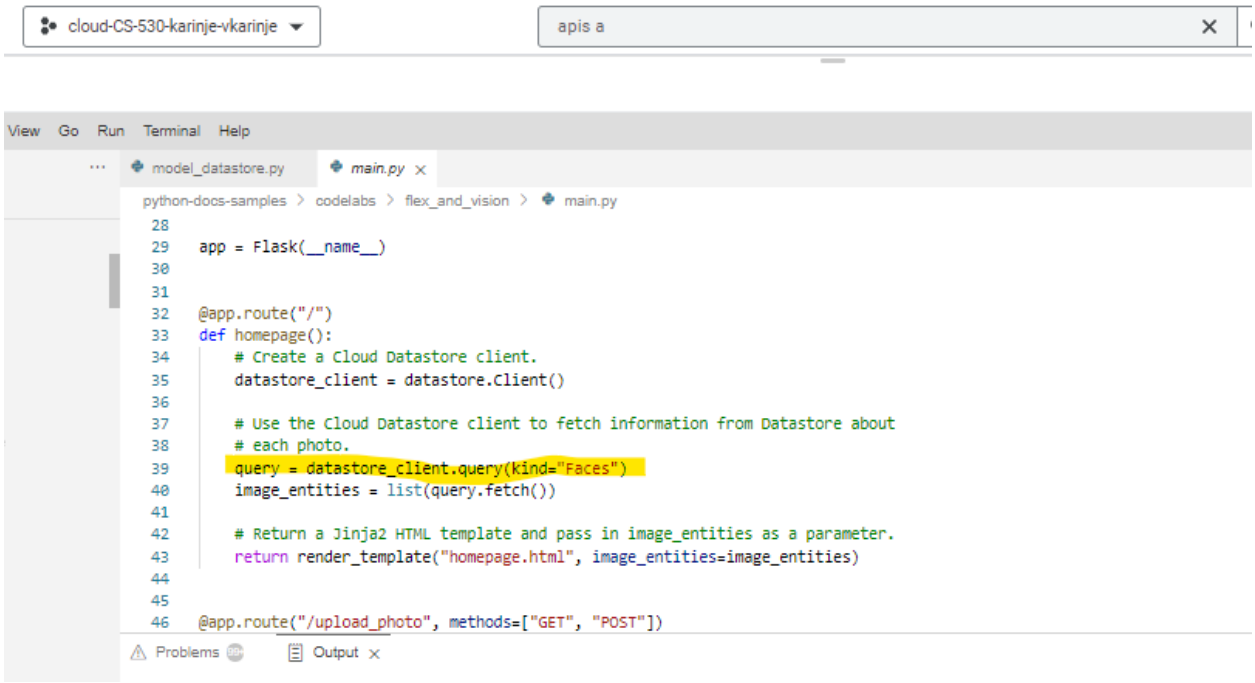




Code

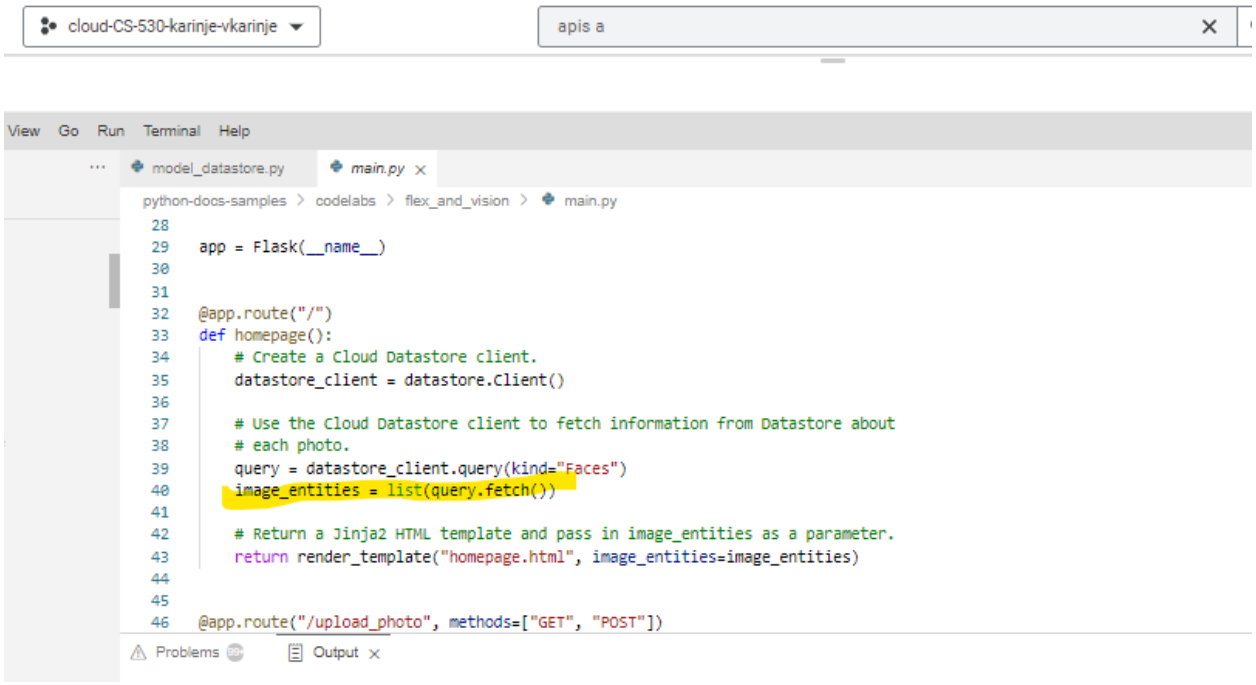
Answer the following questions:

- What line of code creates the query for previous detections?



Line 39

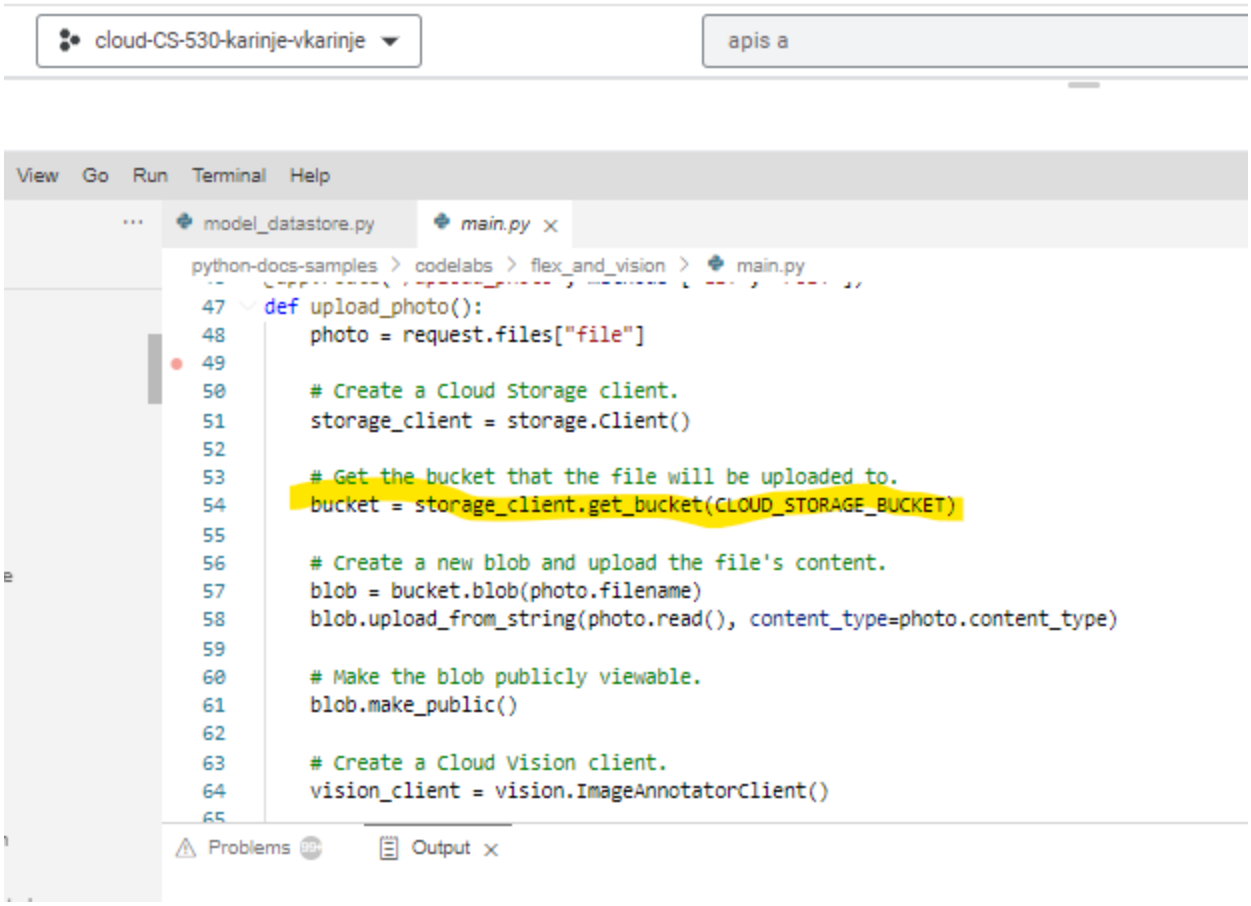
- What line of code sends the query to Cloud Datastore?



Line 40

- Show the line that retrieves the name of the storage bucket to use.

```
25
26 CLOUD_STORAGE_BUCKET = os.environ.get("CLOUD_STORAGE_BUCKET")
27
28
```



Line 26 , Line 54

- What form field is used to specify the uploaded photo?

```
photo = request.files["file"]
```

The form field input of the type file specifies the uploaded photo.

- Show the line that copies the photo's contents to the storage bucket.

```
source_uri = "gs://{}/{}".format(CLOUD_STORAGE_BUCKET, blob.name)
```

```
# Create a new blob and upload the file's content.
blob = bucket.blob(photo.filename)
blob.upload_from_string(photo.read(), content_type=photo.content_type)
```

- What method in Vision's annotation client is used to perform the analysis?

Ans: vision_client.face_detection(image=image)

- What fields are stored in Cloud Datastore for each image?

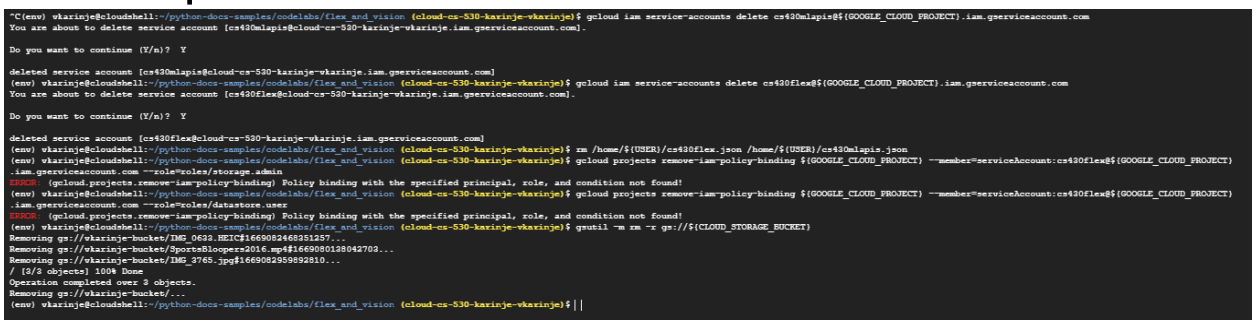
  blob_name, image_public_url, timestamp, joy

```
# construct the new entity using the key. Set dictionary val
# keys blob_name, storage_public_url, timestamp, and joy.
entity = datastore.Entity(key)
entity["blob_name"] = blob.name
entity["image_public_url"] = blob.public_url
entity["timestamp"] = current_datetime
entity["joy"] = face_joy
```

- What happens at the end of the upload_photo route?

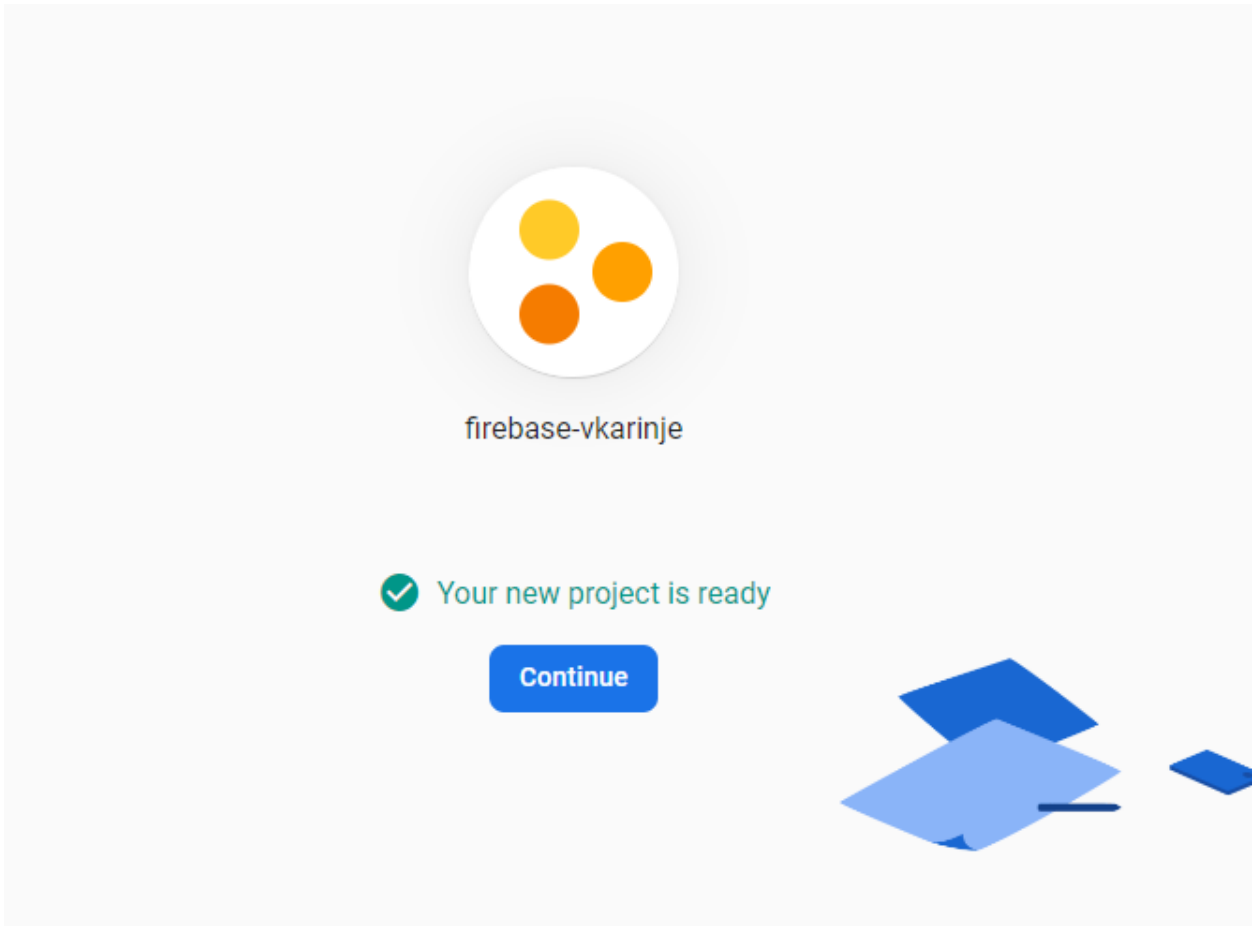
  It redirects to home page

Clean up

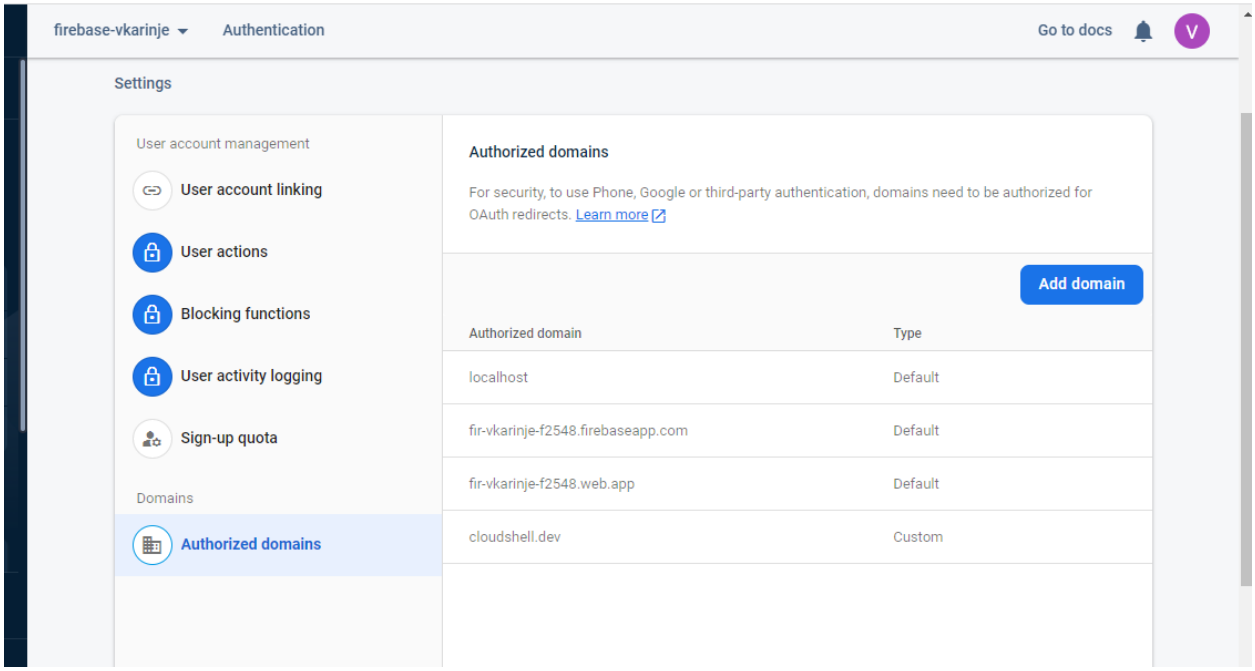


08.3g: Firebase

Project setup



Authentication setup

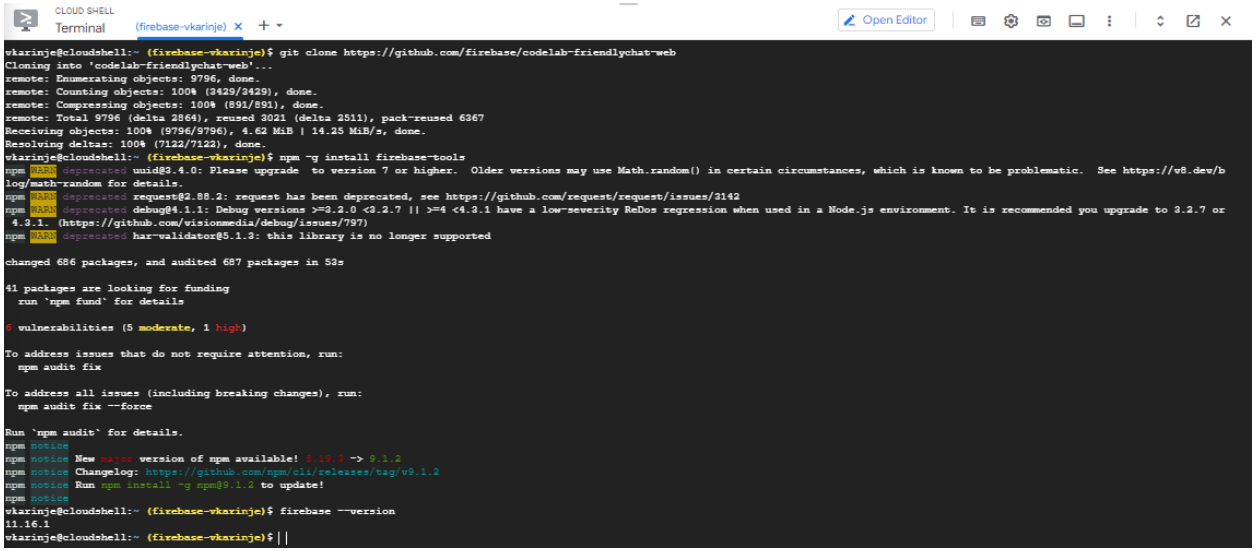


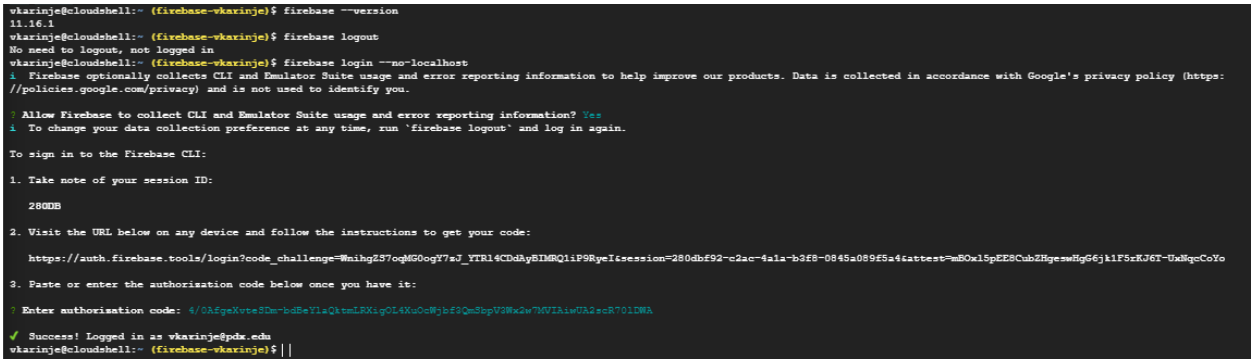
Answer the following questions for your lab notebook

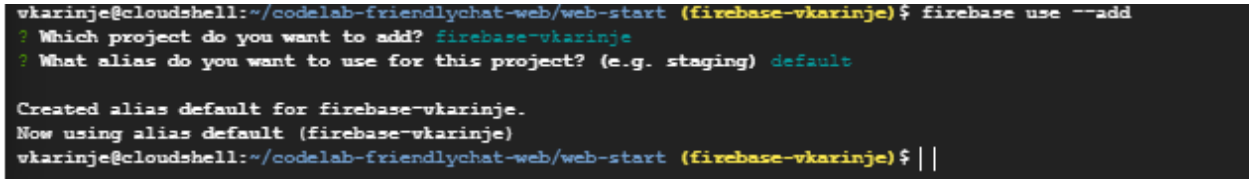
- What other domains are given access to this Firebase project by default?

  Ans: localhost, fir-vkarinje-f2548.firebaseapp.com, fir-vkarinje-f2548.web.app

CLI setup



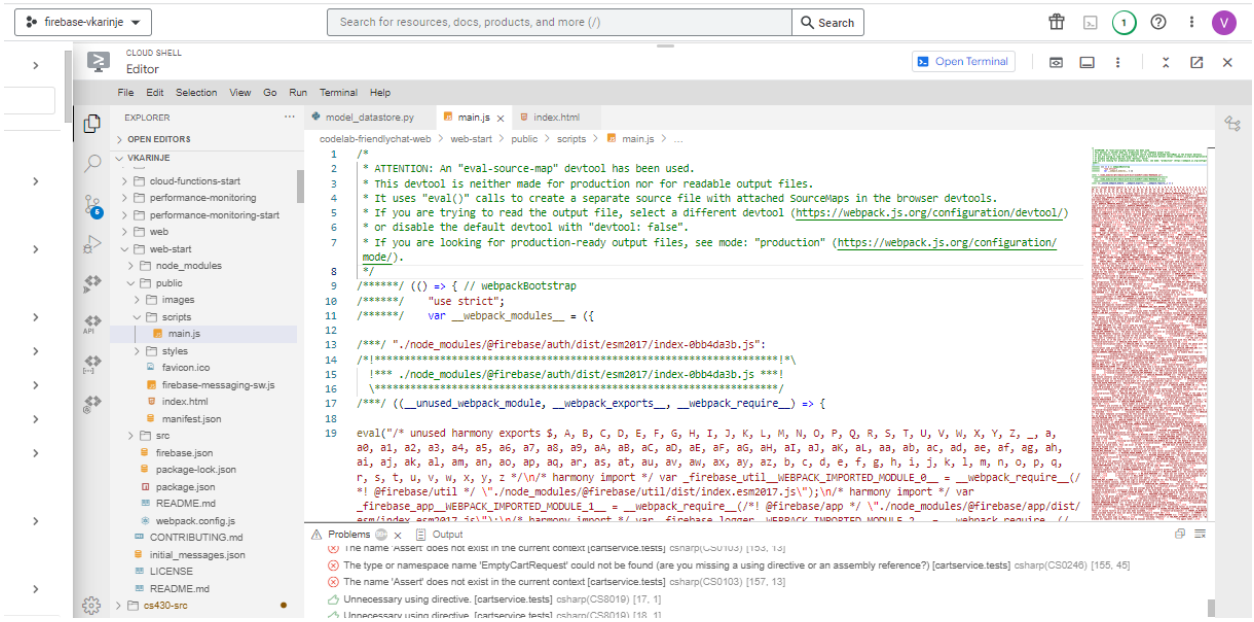


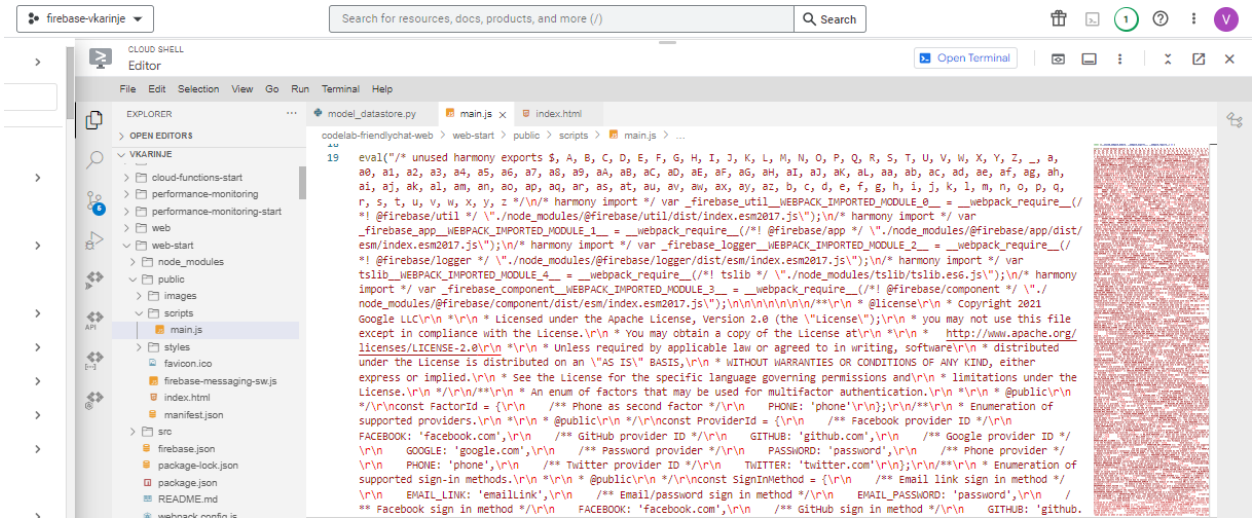


Bundling with Webpack

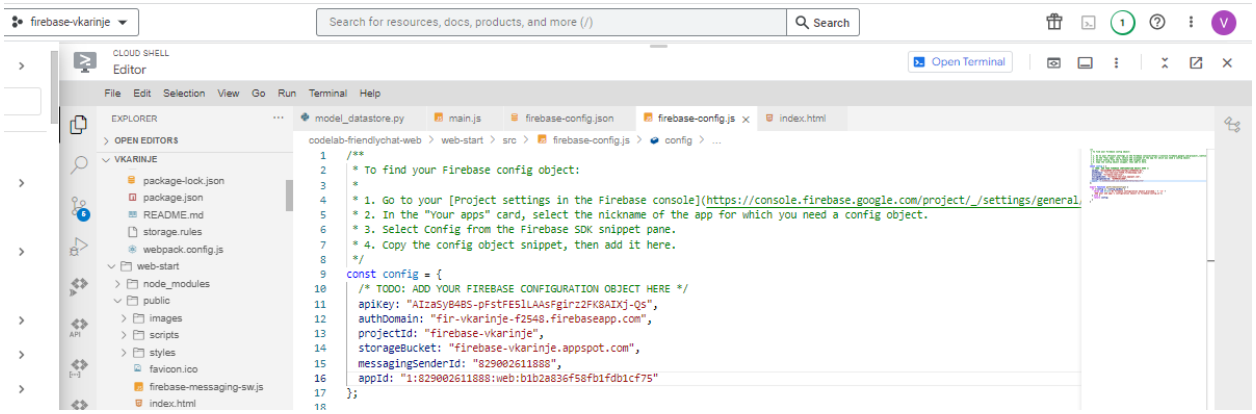
```
vkarinje@cloudshell:~/codelab-friendlychat-web/web-start (firebase-vkarinje)$ npm install

added 244 packages, and audited 245 packages in 15s

20 packages are looking for funding
  run `npm fund` for details

found 0 vulnerabilities
vkarinje@cloudshell:~/codelab-friendlychat-web/web-start (firebase-vkarinje)$ npm run start

> friendlychat@1.0.0 start
> webpack --watch --progress

asset main.js 4.21 MiB [emitted] (name: main)
runtime modules 617 bytes 3 modules
modules by path ./node_modules/ 1.58 MiB
  modules by path ./node_modules/@firebase/ 1.56 MiB
    modules by path ./node_modules/@firebase/auth/dist/esm2017/*.js 378 KiB 2 modules
    + 10 modules
  modules by path ./node_modules/firebase/ 1.17 KiB
    ./node_modules/firebase/app/dist/index.esm.js 827 bytes [built] [code generated]
    + 5 modules
  modules by path ./node_modules/idb/build/*.js 10.4 KiB
    ./node_modules/idb/build/index.js 3.09 KiB [built] [code generated]
    ./node_modules/idb/build/wrap-idb-value.js 7.32 KiB [built] [code generated]
  ./node_modules/tslib/tslib.es6.js 12 KiB [built] [code generated]
modules by path ./src/*.js 11.1 KiB
  ./src/index.js 10.4 KiB [built] [code generated]
  ./src/firebase-config.js 719 bytes [built] [code generated]
webpack 5.75.0 compiled successfully in 1751 ms

asset firebase-messaging-sw.js 1.74 KiB [emitted] (name: main)
./src/firebase-messaging-sw.js 55 bytes [built] [code generated]
webpack 5.75.0 compiled successfully in 180 ms
```

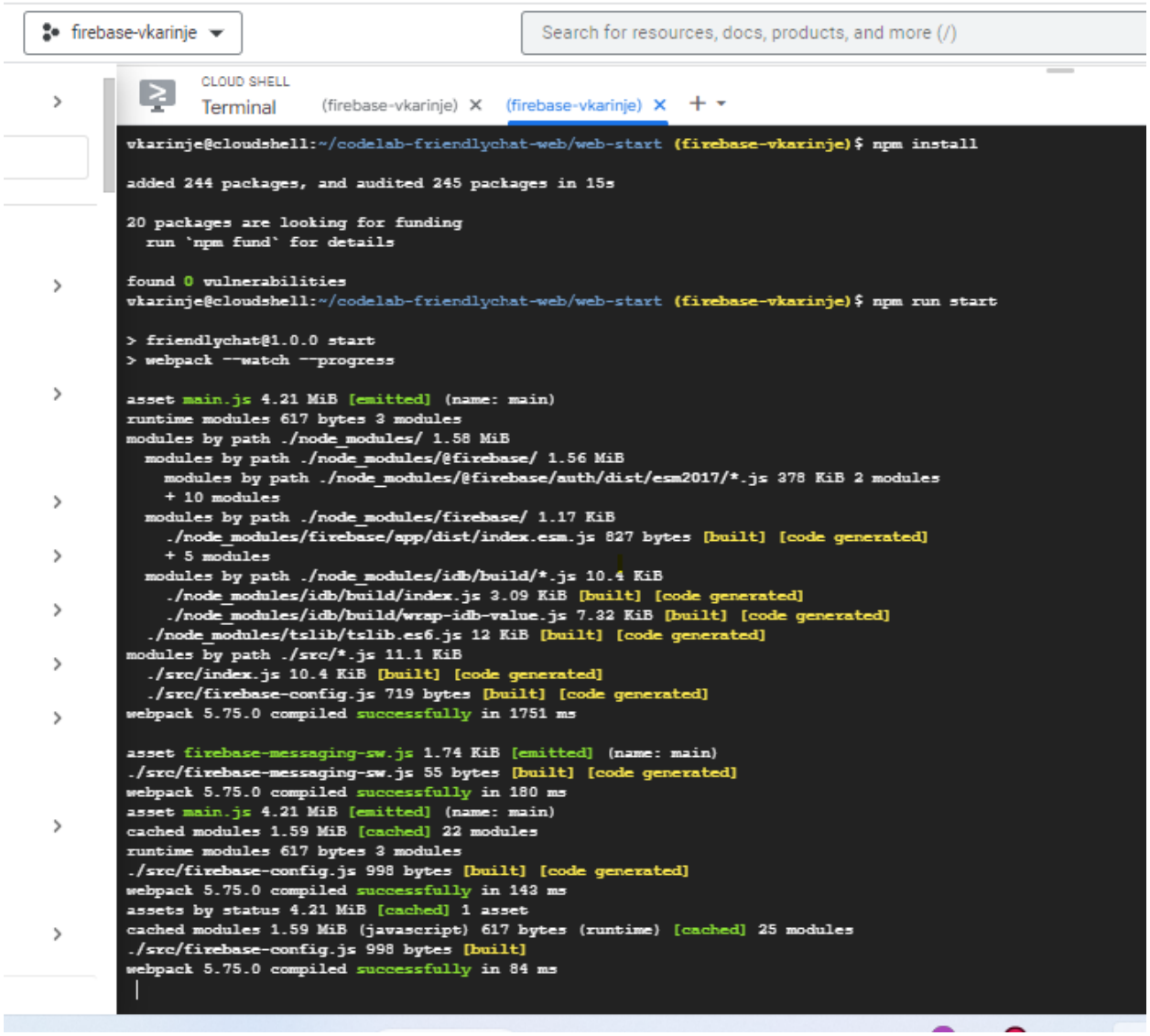
- Take a screenshot of the first 10 lines of the produced file.



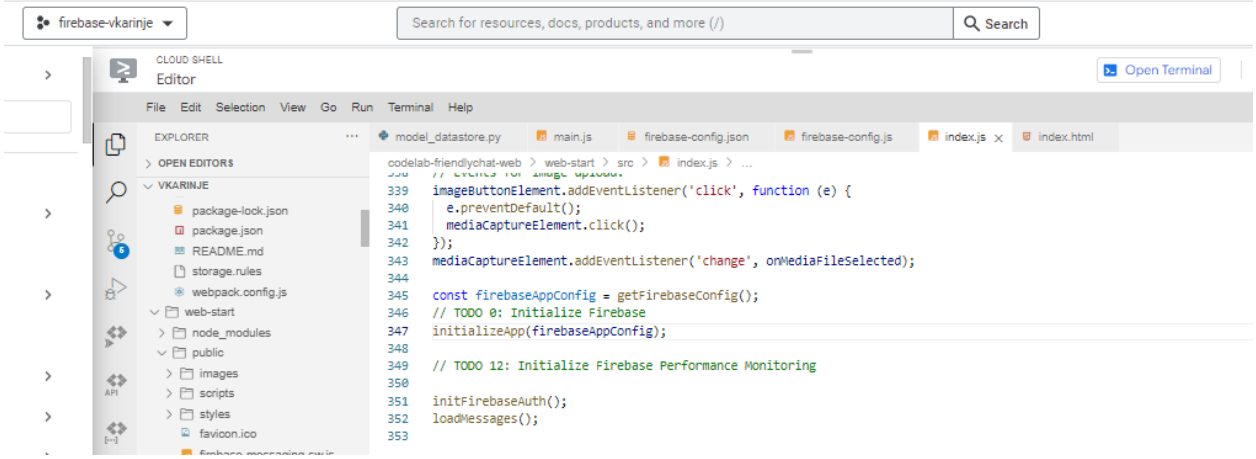


Configure Firebase within application

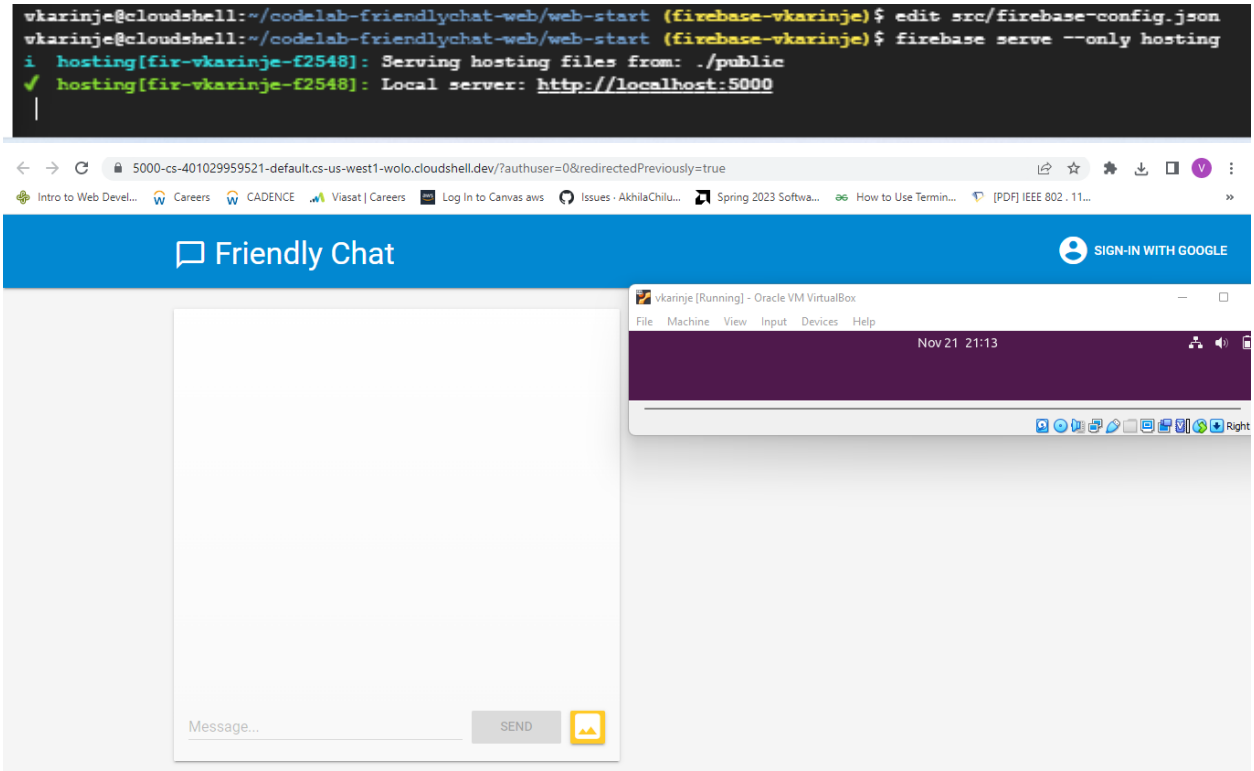




Initialize Firebase within application



Test application



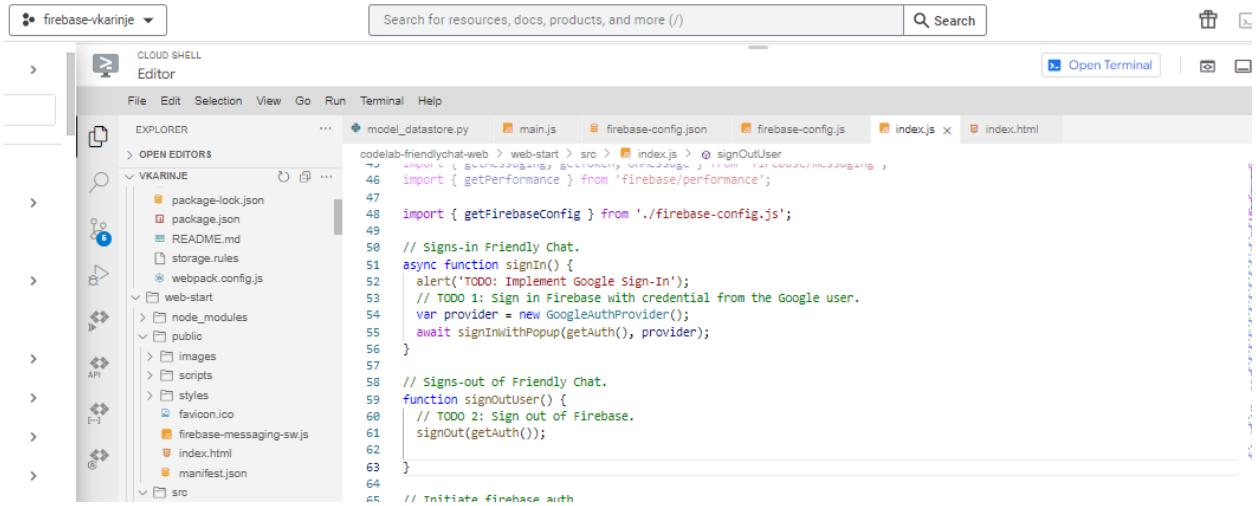
Add authentication

- What missing functions deal with user authentication?

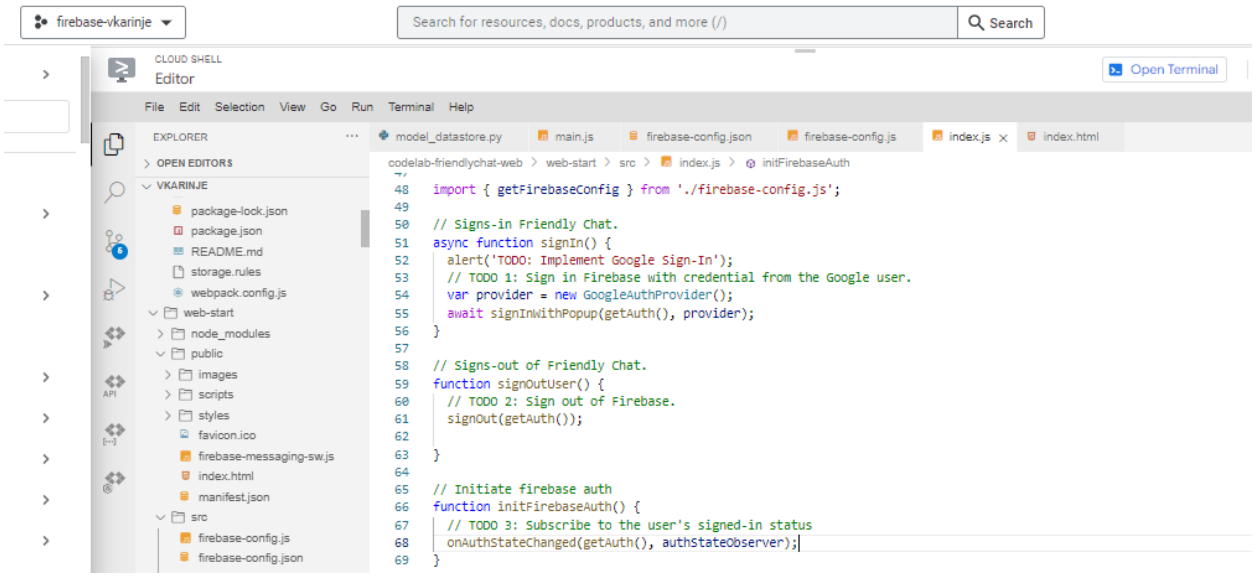
  initFirebaseAuth(), signIn, isUserSignedIn, signOut, deal with user authentication.

- What missing functions deal with sending and receiving messages?

saveMessage, loadMessages, deleteMessage, displayMessage, saveImageMessage deal with sending and receiving messages.



Update UI



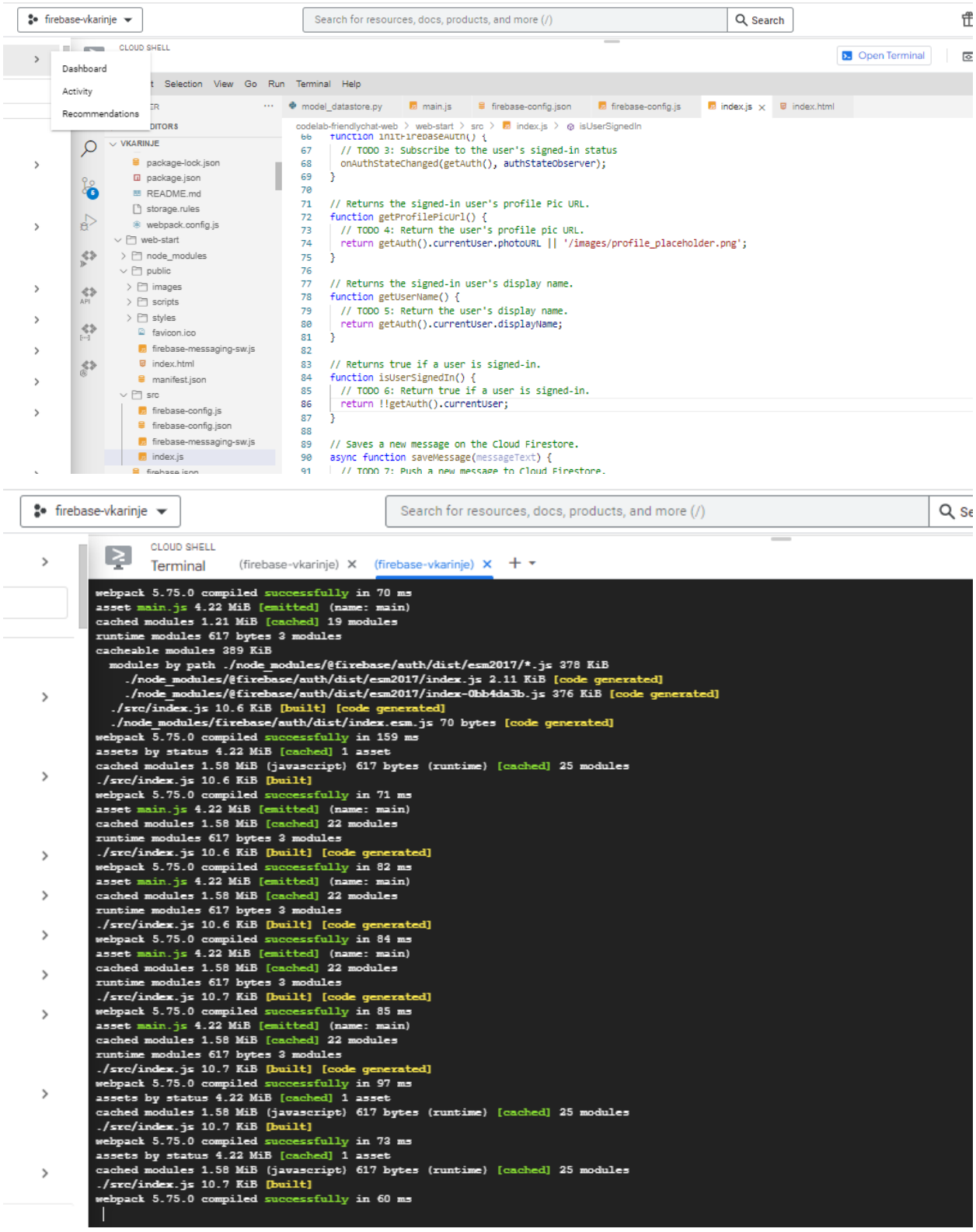
Answer the following questions:

- What are the names of the elements that are hidden when the user is signed out?

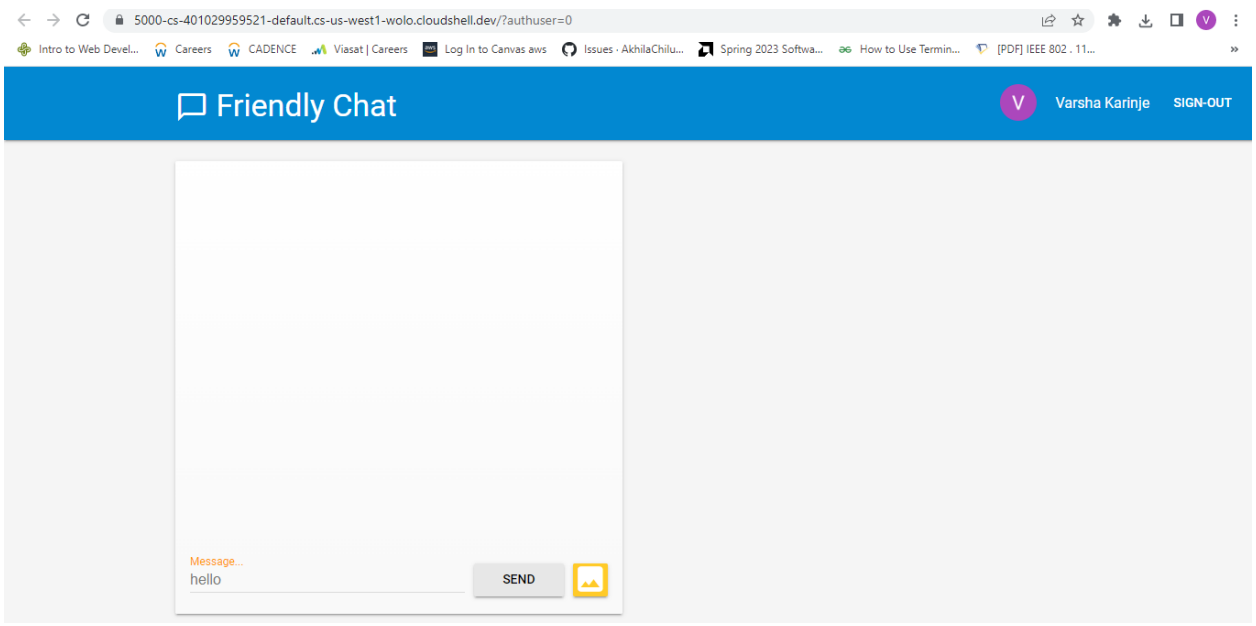
userNameElement, userPicElement, signOutButtonElement are hidden when the user is signed out.

- What is the name of the element that is not hidden when the user is signed out?

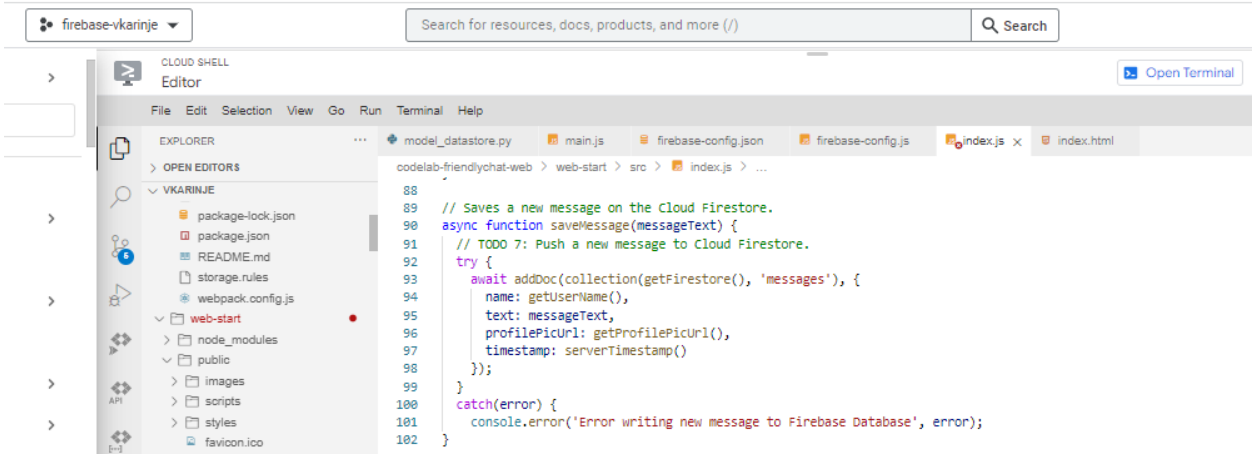
signInButtonElement

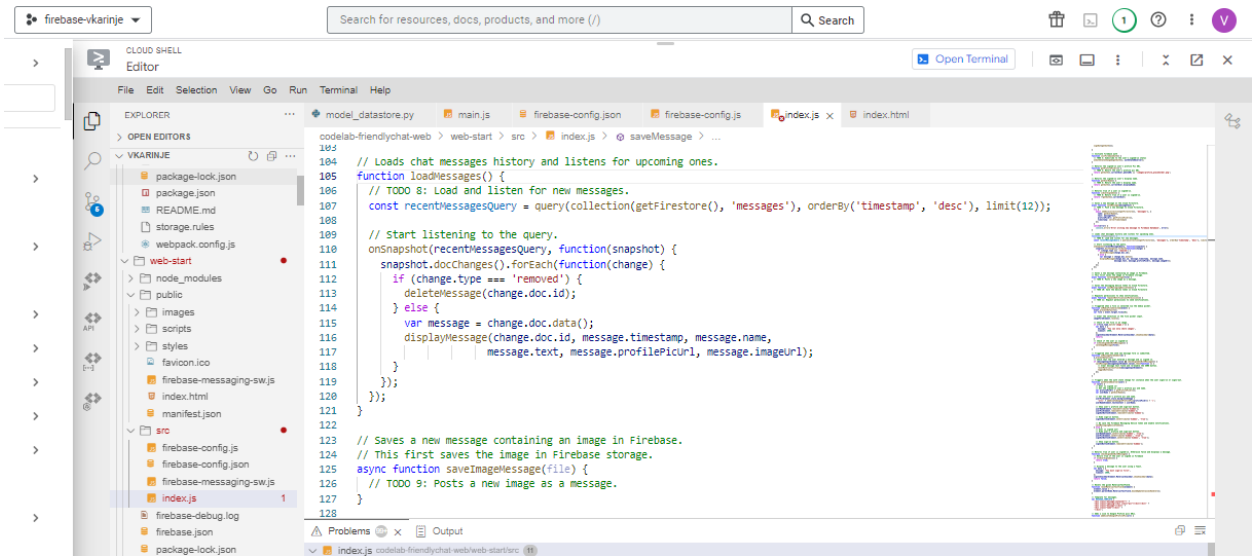


Test application with authentication

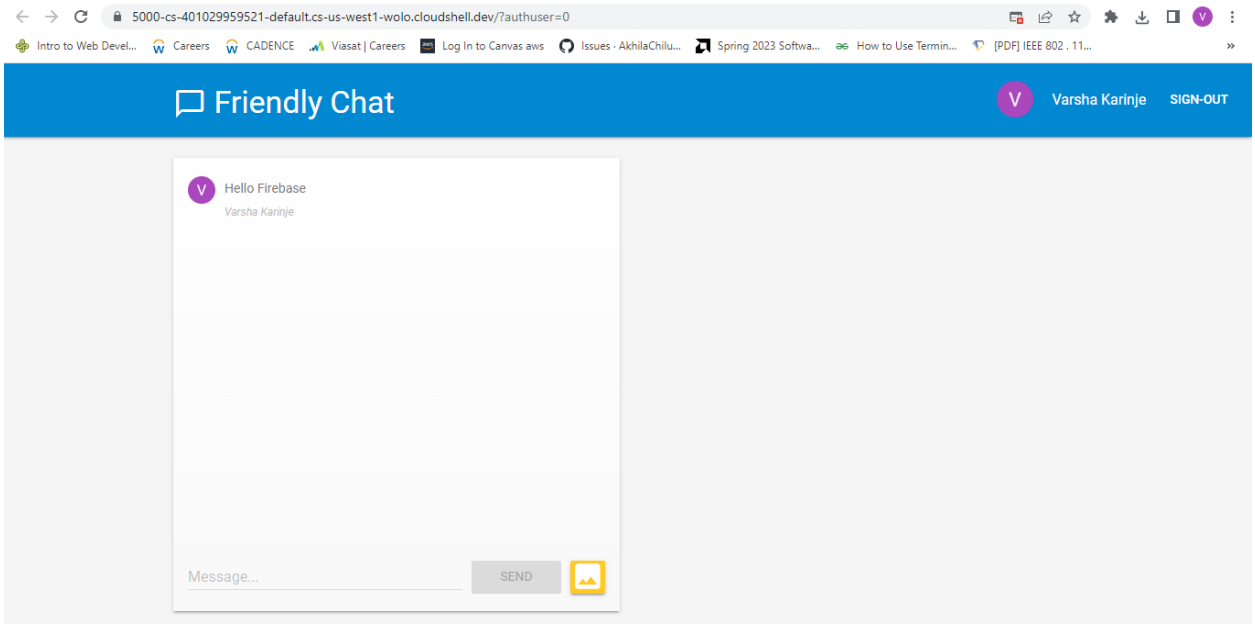


Add text messaging

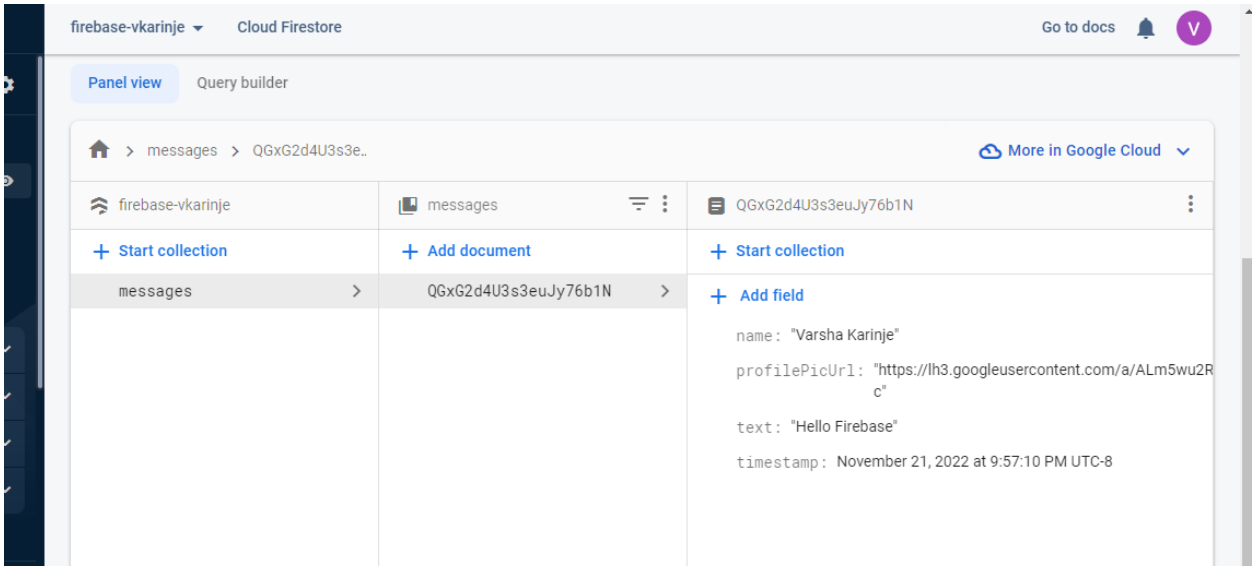




Test application with text messaging

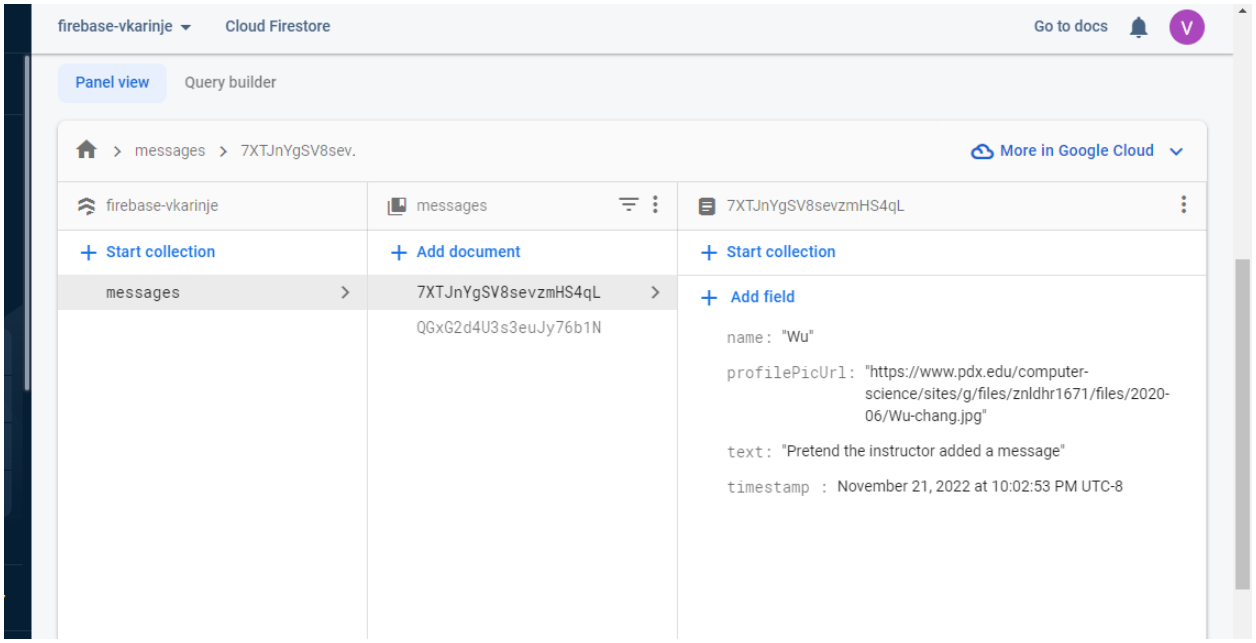


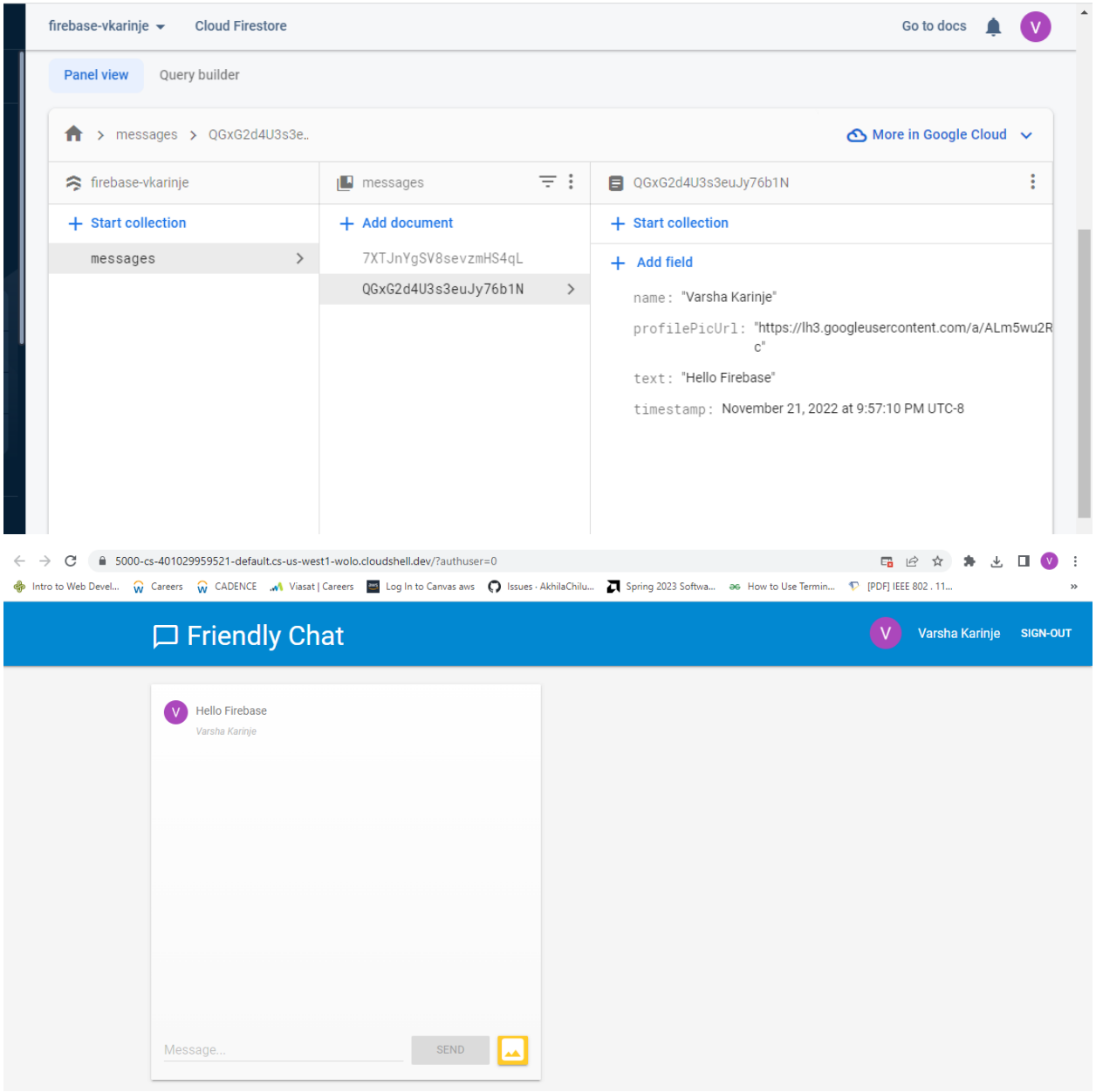
- Include a screenshot of the message and its fields in the database for your lab notebook



Manual message insertion

- Include a screenshot of the application with its two messages for your lab notebook





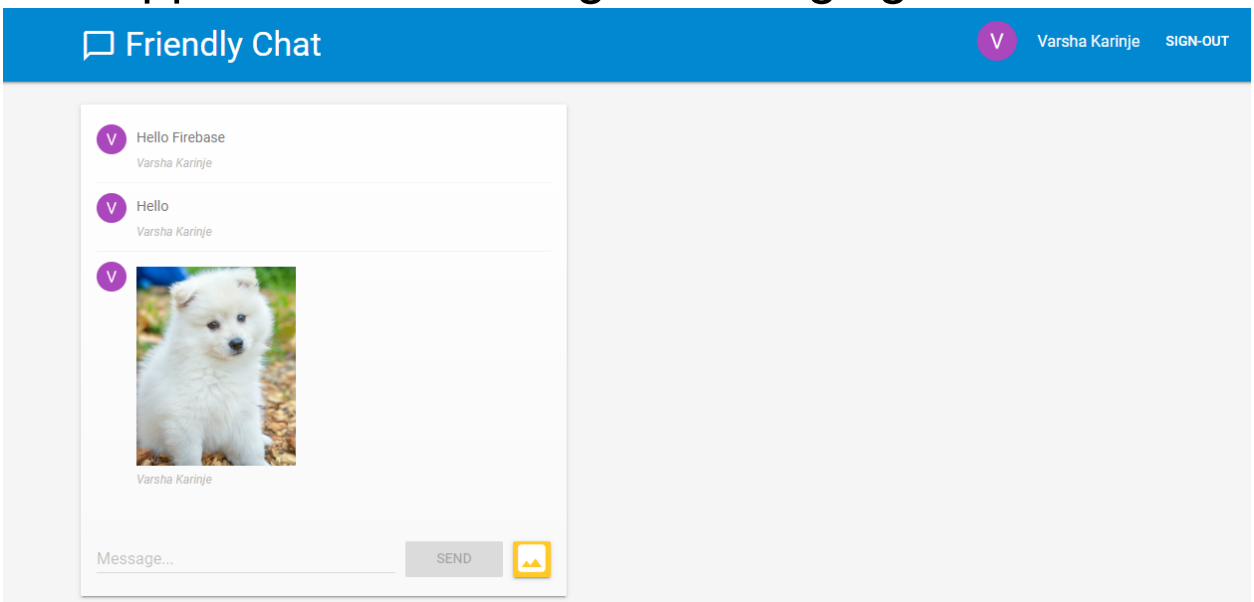
Add image messaging

In examining the code, answer the following question for your lab notebook:

- What is the URL of the image that is first shown in the UI as the message is loading?

  https://lh3.googleusercontent.com/a/ALm5wu2RgEPyN4e5L3uRdAO1yz6Bdw6dXyfX8Ui66AVR=s96-c

Test application with image messaging

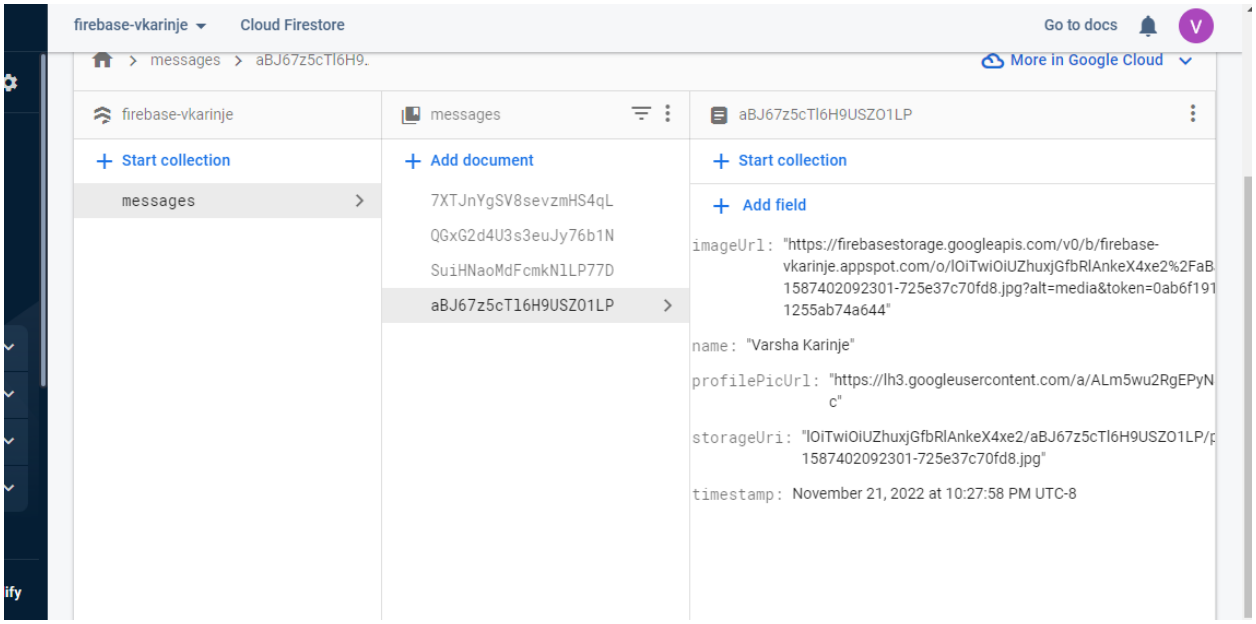


Answer the following questions:

- How do the fields in an image document differ from that of the text document?

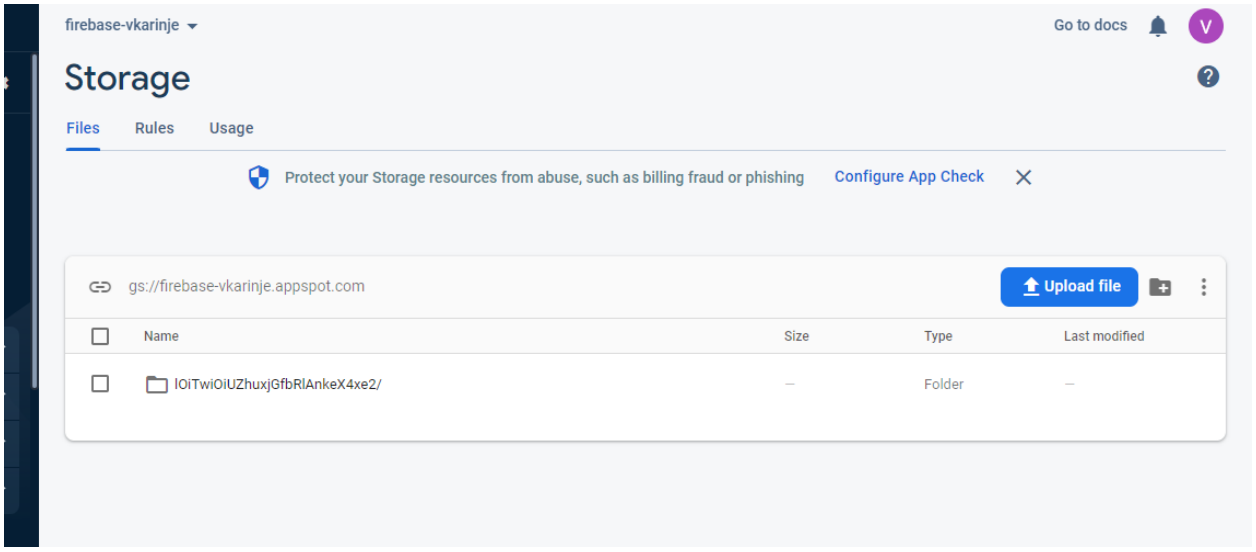
There are extra fields such as imageUrl, name, profilePicUrl, storageUri, timestamp for image document.
For text documents the fields are name, profilePicUrl,text, timestamp.

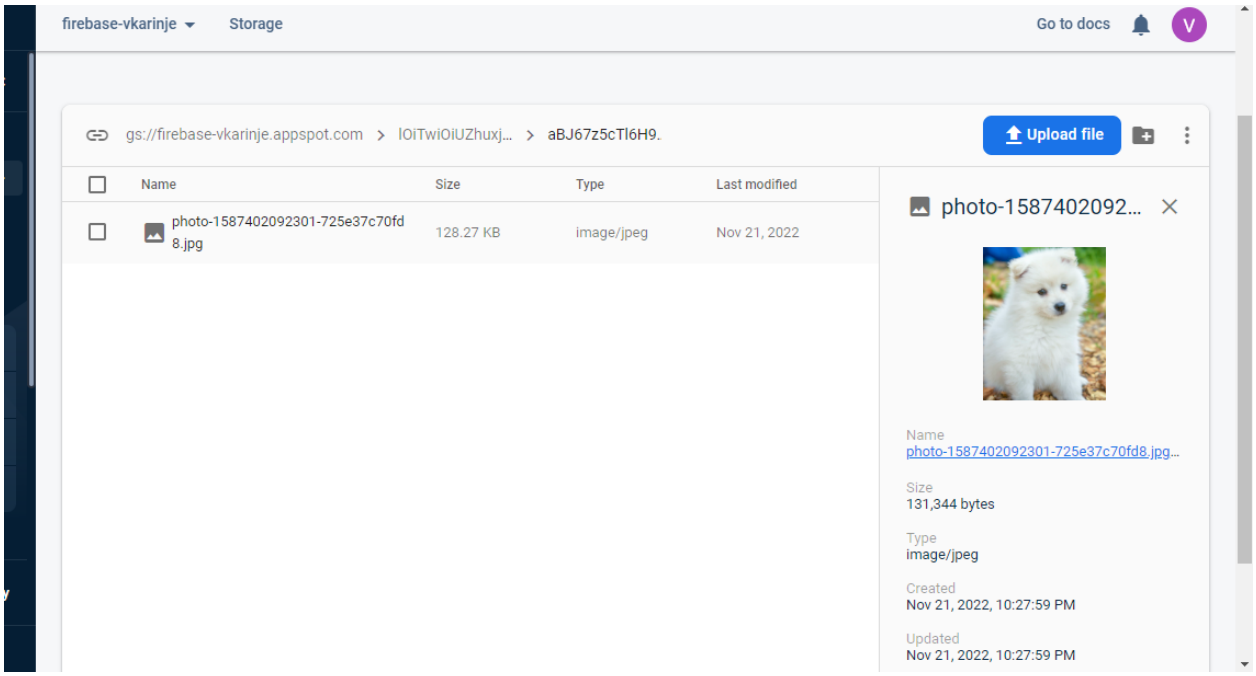
- What URL and storage location can the image be found at?



The image can be found at "https://firebasestorage.googleapis.com/v0/b/firebase-vkarinje.appspot.com/o/lOiTwiOiUZhuxjGfbRlAnkeX4xe2%2FaBJ67z5cTl6H9USZO1LP%2Fphoto-1587402092301-725e37c70fd8.jpg?alt=media&token=0ab6f191-01f5-4345-bd4b-1255ab74a644"
Storage location is "lOiTwiOiUZhuxjGfbRlAnkeX4xe2/aBJ67z5cTl6H9USZO1LP/photo-1587402092301-725e37c70fd8.jpg"

- Take a screenshot of the image in the storage bucket for your lab notebook.





Deploy application

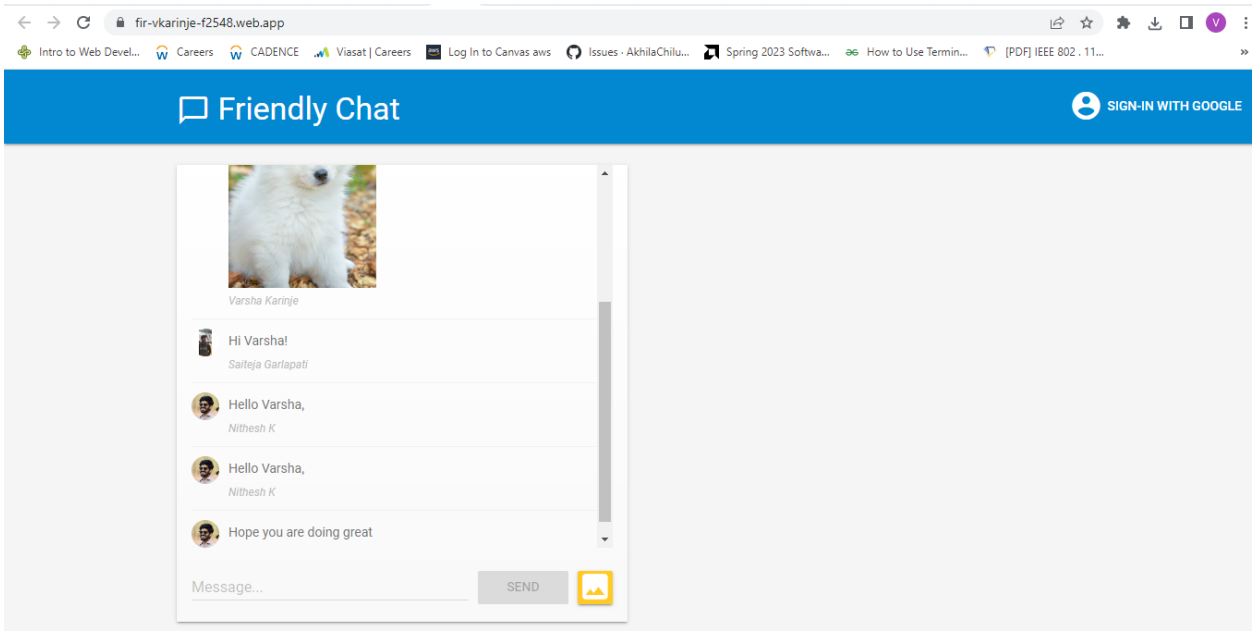
Answer the following questions:

- What directory is the application going to be served from?

The application is going to be served from the public directory.

- What does the Cache-Control setting configured for the HTML and Javascript files do?

The max-age =0 setting in the Cache-Control setting will fetch the latest versions of HTML and Javascript files. If no-cache attribute is defined it will always fetch the latest version of the files. The Cache-Control tell the browser not to store anything.

```
vkarinje@cloudshell:~/codelab-friendlychat-web/web-start (firebase-vkarinje)$ firebase deploy --except functions

=== Deploying to 'firebase-vkarinje'...

i  deploying hosting
i  hosting[fir-vkarinje-f2548]: beginning deploy...
i  hosting[fir-vkarinje-f2548]: found 8 files in ./public
✓  hosting[fir-vkarinje-f2548]: file upload complete
i  hosting[fir-vkarinje-f2548]: finalizing version...
✓  hosting[fir-vkarinje-f2548]: version finalized
i  hosting[fir-vkarinje-f2548]: releasing new version...
✓  hosting[fir-vkarinje-f2548]: release complete

✓  Deploy complete!

Project Console: https://console.firebase.google.com/project/firebase-vkarinje/overview
Hosting URL: https://fir-vkarinje-f2548.web.app
vkarinje@cloudshell:~/codelab-friendlychat-web/web-start (firebase-vkarinje)$
```

- Take a screenshot of the message including the URL for your lab notebook.