INFO7374 Algorithmic Digital Marketing

Summary	In this assignment, we implemented all the three implementations. And create two respective apps to fulfill the two modes.
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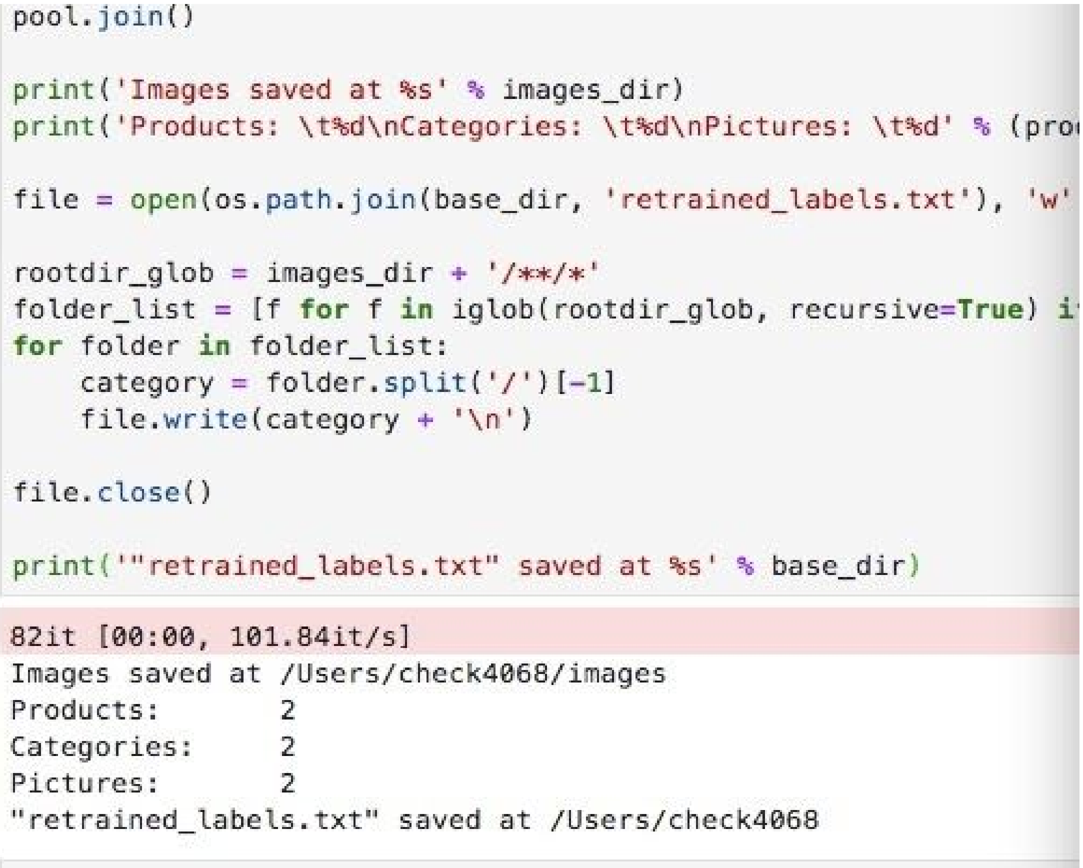
Data Preprocessing

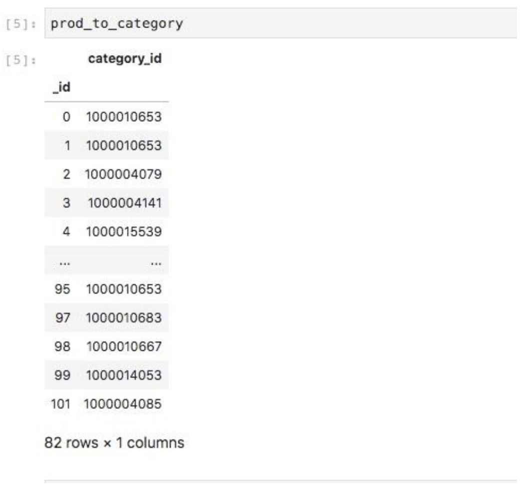
Sampling Data:

We used the **bson_and_image preprocessing.ipynb** to sample dataset, to generate sample images, as well as to have an insight of the category-id



```
pool.join()

print('Images saved at %s' % images_dir)
print('Products: \t%d\nCategories: \t%d\nPictures: \t%d' % (pro

file = open(os.path.join(base_dir, 'retrained_labels.txt'), 'w'

rootdir_glob = images_dir + '/**/*'
folder_list = [f for f in iglob(rootdir_glob, recursive=True) i
for folder in folder_list:
    category = folder.split('/')[-1]
    file.write(category + '\n')

file.close()

print('"retrained_labels.txt" saved at %s' % base_dir)
```

```
82it [00:00, 101.84it/s]
Images saved at /Users/check4068/images
Products:       2
Categories:     2
Pictures:       2
"retrained_labels.txt" saved at /Users/check4068
```

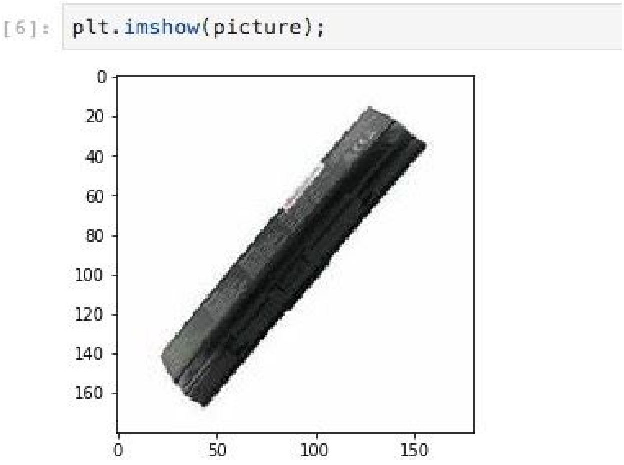


```
[5]: prod_to_category
```

[5]:

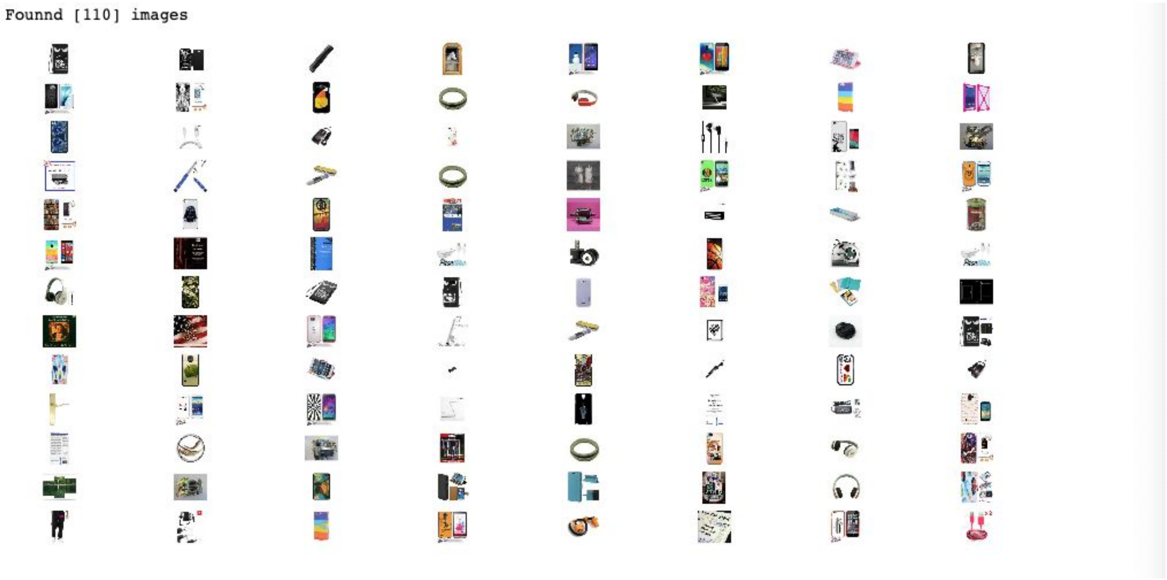
_id	category_id
0	1000010653
1	1000010653
2	1000004079
3	1000004141
4	1000015539
...	...
95	1000010653
97	1000010683
98	1000010667
99	1000014053
101	1000004085

82 rows × 1 columns



```
[6]: plt.imshow(picture);
```

Sample Images to Use:



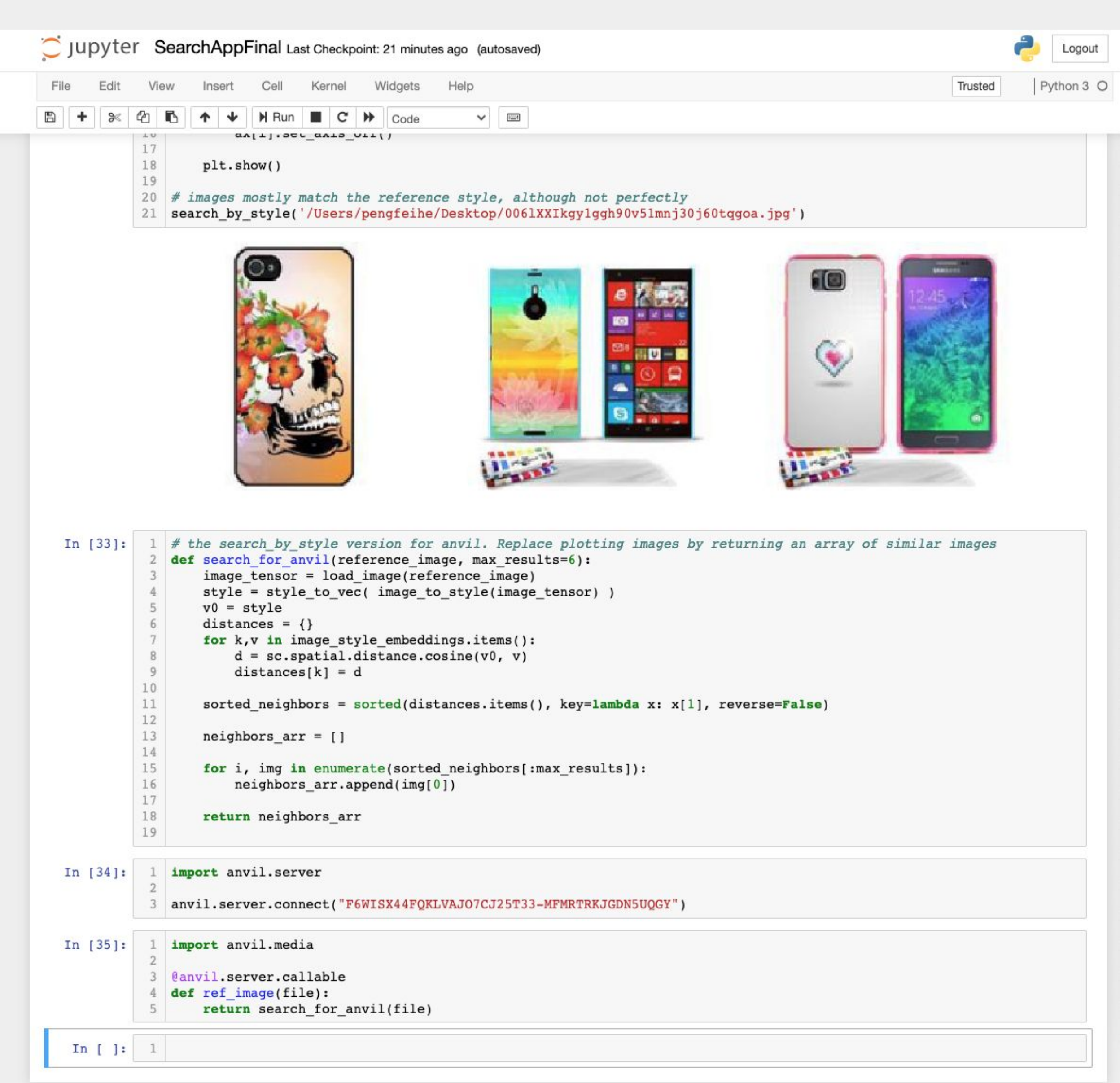
```
Founnd [110] images
```

Implement of Version 1 (App mode 2)

We used the **first implement version** to create an app **fulfill the mode two**, which allows user to upload a new image and return k images similar to it. This app is published on **Anvil cloud**. The public url is **bitter-general-top.anvil.app**

Implementing version_1 locally:

We modified the search_by_style function, by generating a new style for each new uploaded image, and then match this new style to the existing style array. In this way, we can allow users to **randomly upload any images**, and still can return the best similar images.



```python
        ax[i].set_axis_off()

    plt.show()

# images mostly match the reference style, although not perfectly
search_by_style('/Users/pengfeihe/Desktop/006lXXIkgylggh90v5lmnj30j60tqgoa.jpg')
```

In [33]:

```python
# the search_by_style version for anvil. Replace plotting images by returning an array of similar images
def search_for_anvil(reference_image, max_results=6):
    image_tensor = load_image(reference_image)
    style = style_to_vec( image_to_style(image_tensor) )
    v0 = style
    distances = {}
    for k,v in image_style_embeddings.items():
        d = sc.spatial.distance.cosine(v0, v)
        distances[k] = d

    sorted_neighbors = sorted(distances.items(), key=lambda x: x[1], reverse=False)

    neighbors_arr = []

    for i, img in enumerate(sorted_neighbors[:max_results]):
        neighbors_arr.append(img[0])

    return neighbors_arr

```

In [34]:

```python
import anvil.server

anvil.server.connect("F6WISX44FQKLVAJO7CJ25T33-MFMRTRKJGDN5UQGY")
```

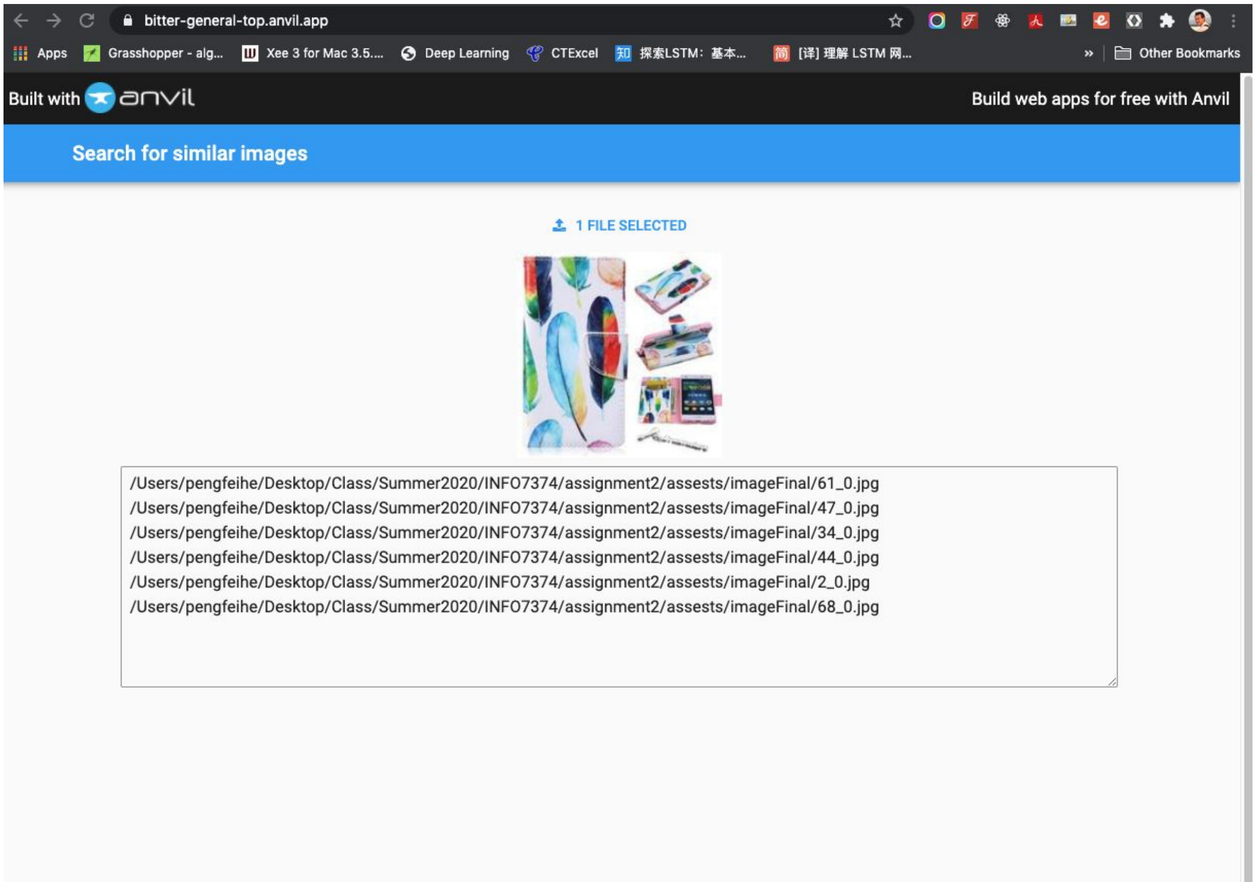
In [35]:

```python
import anvil.media

@anvil.server.callable
def ref_image(file):
    return search_for_anvil(file)
```

In [ ]:

Deployed to Anvil Cloud (url:bitter-general-top.anvil.app)

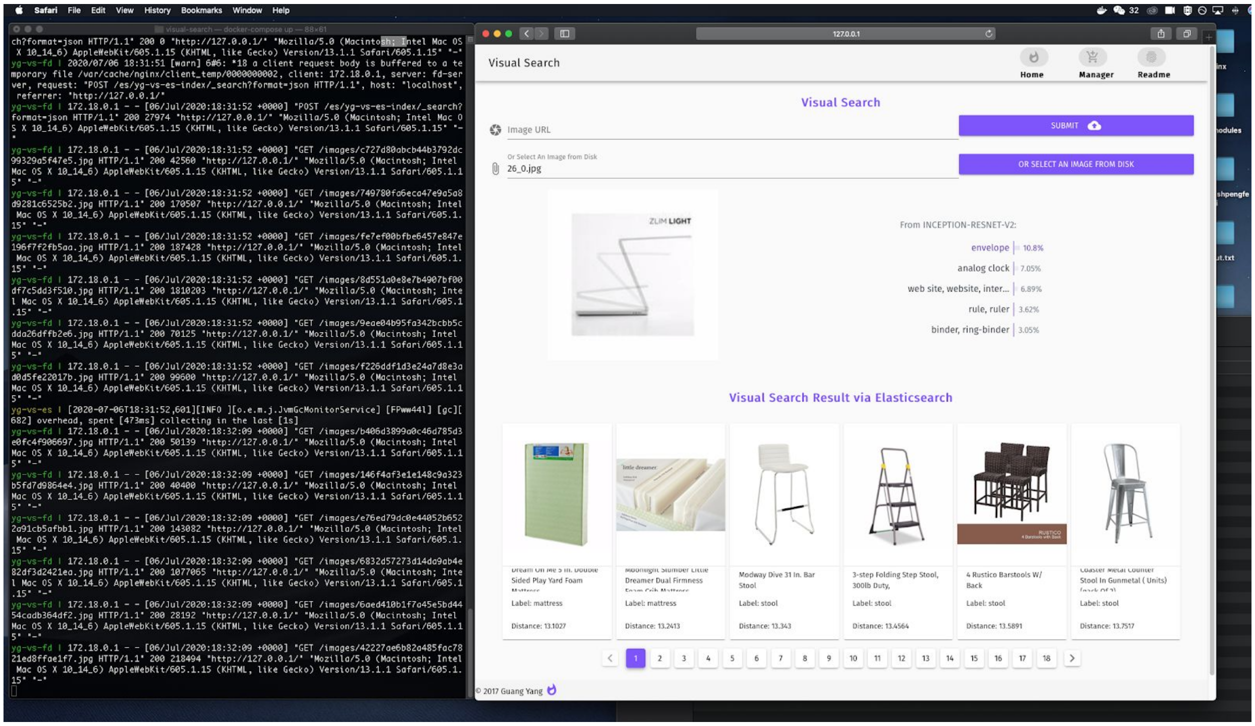
We used Anvil to turn the jupyter notebook into a web app. And deployed it into Anvil Cloud server.



```
/Users/pengfeihe/Desktop/Class/Summer2020/INFO7374/assignment2/assests/imageFinal/61_0.jpg
/Users/pengfeihe/Desktop/Class/Summer2020/INFO7374/assignment2/assests/imageFinal/47_0.jpg
/Users/pengfeihe/Desktop/Class/Summer2020/INFO7374/assignment2/assests/imageFinal/34_0.jpg
/Users/pengfeihe/Desktop/Class/Summer2020/INFO7374/assignment2/assests/imageFinal/44_0.jpg
/Users/pengfeihe/Desktop/Class/Summer2020/INFO7374/assignment2/assests/imageFinal/2_0.jpg
/Users/pengfeihe/Desktop/Class/Summer2020/INFO7374/assignment2/assests/imageFinal/68_0.jpg
```

Implement of Version 2 (Run on docker)

Since the reference app for the **second implement version** is already a fully developed search app. We just **run it on docker** to use it.



```
ch?format=json HTTP/1.1" 200 0 "http://127.0.0.1/" "Mozilla/5.0 (Macintosh; Intel Mac OS
 X 10_14_6) AppleWebKit/605.1.15 (KHTML, like Gecko) Version/13.1.1 Safari/605.1.15" "-"
yg-vs-fd | 2020/07/06 18:31:51 [warn] 6#6: *18 a client request body is buffered to a te
mporary file /var/cache/nginx/client_temp/0000000002, client: 172.18.0.1, server: fd-ser
ver, request: "POST /es/yg-vs-es-index/_search?format=json HTTP/1.1", host: "localhost",
 referrer: "http://127.0.0.1/"
yg-vs-fd | 172.18.0.1 - - [06/Jul/2020:18:31:52 +0000] "POST /es/yg-vs-es-index/_search?
format=json HTTP/1.1" 200 27974 "http://127.0.0.1/" "Mozilla/5.0 (Macintosh; Intel Mac O
S X 10_14_6) AppleWebKit/605.1.15 (KHTML, like Gecko) Version/13.1.1 Safari/605.1.15" "-
"
yg-vs-fd | 172.18.0.1 - - [06/Jul/2020:18:31:52 +0000] "GET /images/c727d80abcb44b3792dc
99329a5f47e5.jpg HTTP/1.1" 200 42560 "http://127.0.0.1/" "Mozilla/5.0 (Macintosh; Intel
Mac OS X 10_14_6) AppleWebKit/605.1.15 (KHTML, like Gecko) Version/13.1.1 Safari/605.1.1
5" "-"
yg-vs-fd | 172.18.0.1 - - [06/Jul/2020:18:31:52 +0000] "GET /images/749780fa6eca47e9a5a8
d9281c6525b2.jpg HTTP/1.1" 200 170507 "http://127.0.0.1/" "Mozilla/5.0 (Macintosh; Intel
 Mac OS X 10_14_6) AppleWebKit/605.1.15 (KHTML, like Gecko) Version/13.1.1 Safari/605.1.
15" "-"
yg-vs-fd | 172.18.0.1 - - [06/Jul/2020:18:31:52 +0000] "GET /images/fe7ef00bfbe6457e847e
196f7f2fb5aa.jpg HTTP/1.1" 200 187428 "http://127.0.0.1/" "Mozilla/5.0 (Macintosh; Intel
 Mac OS X 10_14_6) AppleWebKit/605.1.15 (KHTML, like Gecko) Version/13.1.1 Safari/605.1.
15" "-"
yg-vs-fd | 172.18.0.1 - - [06/Jul/2020:18:31:52 +0000] "GET /images/8d551a0e8e7b4907bf00
df7c5dd3f510.jpg HTTP/1.1" 200 1810203 "http://127.0.0.1/" "Mozilla/5.0 (Macintosh; Inte
l Mac OS X 10_14_6) AppleWebKit/605.1.15 (KHTML, like Gecko) Version/13.1.1 Safari/605.1
.15" "-"
yg-vs-fd | 172.18.0.1 - - [06/Jul/2020:18:31:52 +0000] "GET /images/9eae04b95fa342bcbb5c
dda26dffb2e6.jpg HTTP/1.1" 200 70125 "http://127.0.0.1/" "Mozilla/5.0 (Macintosh; Intel
Mac OS X 10_14_6) AppleWebKit/605.1.15 (KHTML, like Gecko) Version/13.1.1 Safari/605.1.1
5" "-"
yg-vs-fd | 172.18.0.1 - - [06/Jul/2020:18:31:52 +0000] "GET /images/f226ddf1d3e24a7d8e3a
d0d5fe22017b.jpg HTTP/1.1" 200 99600 "http://127.0.0.1/" "Mozilla/5.0 (Macintosh; Intel
Mac OS X 10_14_6) AppleWebKit/605.1.15 (KHTML, like Gecko) Version/13.1.1 Safari/605.1.1
5" "-"
yg-vs-es | [2020-07-06T18:31:52,601][INFO ][o.e.m.j.JvmGcMonitorService] [FPww44l] [gc][
682] overhead, spent [473ms] collecting in the last [1s]
yg-vs-fd | 172.18.0.1 - - [06/Jul/2020:18:32:09 +0000] "GET /images/b406d3899a0c46d785d3
e0fc4f906697.jpg HTTP/1.1" 200 50139 "http://127.0.0.1/" "Mozilla/5.0 (Macintosh; Intel
Mac OS X 10_14_6) AppleWebKit/605.1.15 (KHTML, like Gecko) Version/13.1.1 Safari/605.1.1
5" "-"
yg-vs-fd | 172.18.0.1 - - [06/Jul/2020:18:32:09 +0000] "GET /images/146f4af3e1e148c9a323
b5fd7d9864e4.jpg HTTP/1.1" 200 40400 "http://127.0.0.1/" "Mozilla/5.0 (Macintosh; Intel
Mac OS X 10_14_6) AppleWebKit/605.1.15 (KHTML, like Gecko) Version/13.1.1 Safari/605.1.1
5" "-"
yg-vs-fd | 172.18.0.1 - - [06/Jul/2020:18:32:09 +0000] "GET /images/e76ed79dc0e44052b652
2a91cb5afbb1.jpg HTTP/1.1" 200 143082 "http://127.0.0.1/" "Mozilla/5.0 (Macintosh; Intel
 Mac OS X 10_14_6) AppleWebKit/605.1.15 (KHTML, like Gecko) Version/13.1.1 Safari/605.1.
15" "-"
yg-vs-fd | 172.18.0.1 - - [06/Jul/2020:18:32:09 +0000] "GET /images/6832d57273d14da9ab4e
82df3d2421ea.jpg HTTP/1.1" 200 1077065 "http://127.0.0.1/" "Mozilla/5.0 (Macintosh; Inte
l Mac OS X 10_14_6) AppleWebKit/605.1.15 (KHTML, like Gecko) Version/13.1.1 Safari/605.1
.15" "-"
yg-vs-fd | 172.18.0.1 - - [06/Jul/2020:18:32:09 +0000] "GET /images/6aed410b1f7a45e5bd44
54cadb364df2.jpg HTTP/1.1" 200 28192 "http://127.0.0.1/" "Mozilla/5.0 (Macintosh; Intel
Mac OS X 10_14_6) AppleWebKit/605.1.15 (KHTML, like Gecko) Version/13.1.1 Safari/605.1.1
5" "-"
yg-vs-fd | 172.18.0.1 - - [06/Jul/2020:18:32:09 +0000] "GET /images/42227ae6b82a485fac78
21ed8ffae1f7.jpg HTTP/1.1" 200 218494 "http://127.0.0.1/" "Mozilla/5.0 (Macintosh; Intel
 Mac OS X 10_14_6) AppleWebKit/605.1.15 (KHTML, like Gecko) Version/13.1.1 Safari/605.1.
15" "-"
```

Visual Search

Visual Search

Image URL

SUBMIT

Or Select An Image from Disk
26_0.jpg

OR SELECT AN IMAGE FROM DISK

From INCEPTION-RESNET-V2:

envelope	10.8%
analog clock	7.05%
web site, website, inter...	6.89%
rule, ruler	3.62%
binder, ring-binder	3.05%

Visual Search Result via Elasticsearch

Dream On Me 5 In. Double Sided Play Yard Foam Mattress	Moonlight Slumber Little Dreamer Dual Firmness Foam Crib Mattress	Modway Dive 31 In. Bar Stool	3-step Folding Step Stool, 300lb Duty,	4 Rustico Barstools W/ Back	Coaster Metal Counter Stool In Gunmetal (Units) (pack Of 2)
Label: mattress	Label: mattress	Label: stool	Label: stool	Label: stool	Label: stool
Distance: 13.1027	Distance: 13.2413	Distance: 13.343	Distance: 13.4564	Distance: 13.5891	Distance: 13.7517

< 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 >

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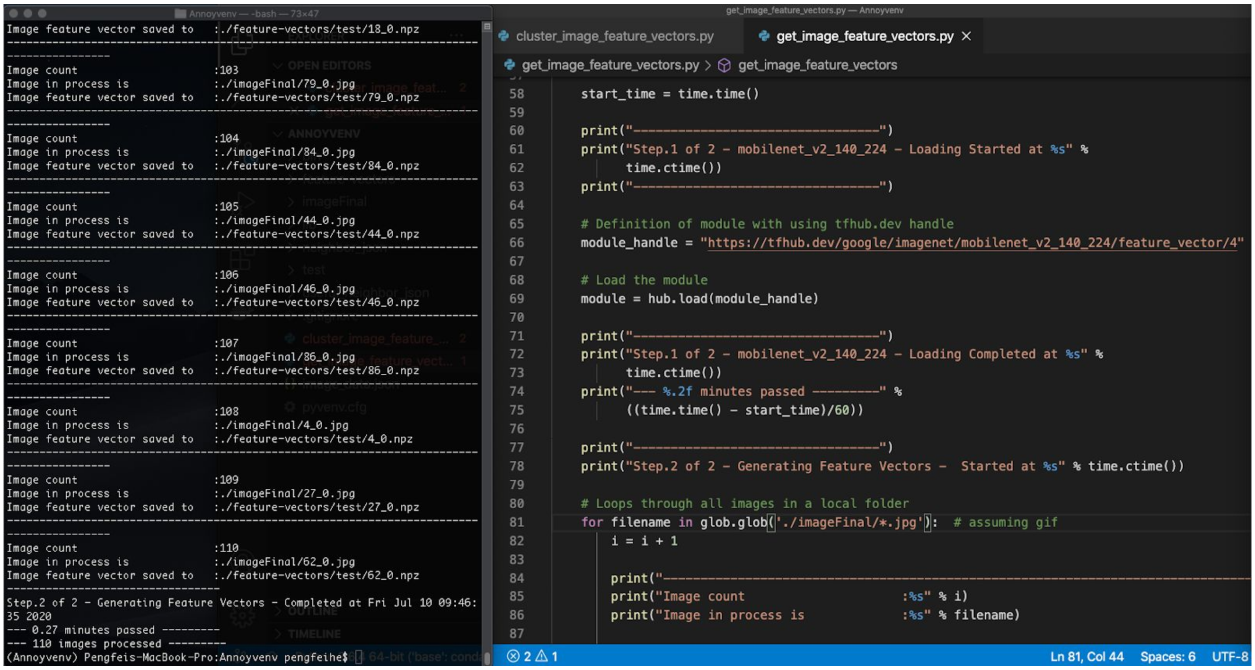
Implement of Version 3 (App mode 1)

We used the **third implement version** to create an app **fulfill the mode one**, which allows the user to select one image and get k similar images based on **elasticsearch**. Our web app is developed using django framework.

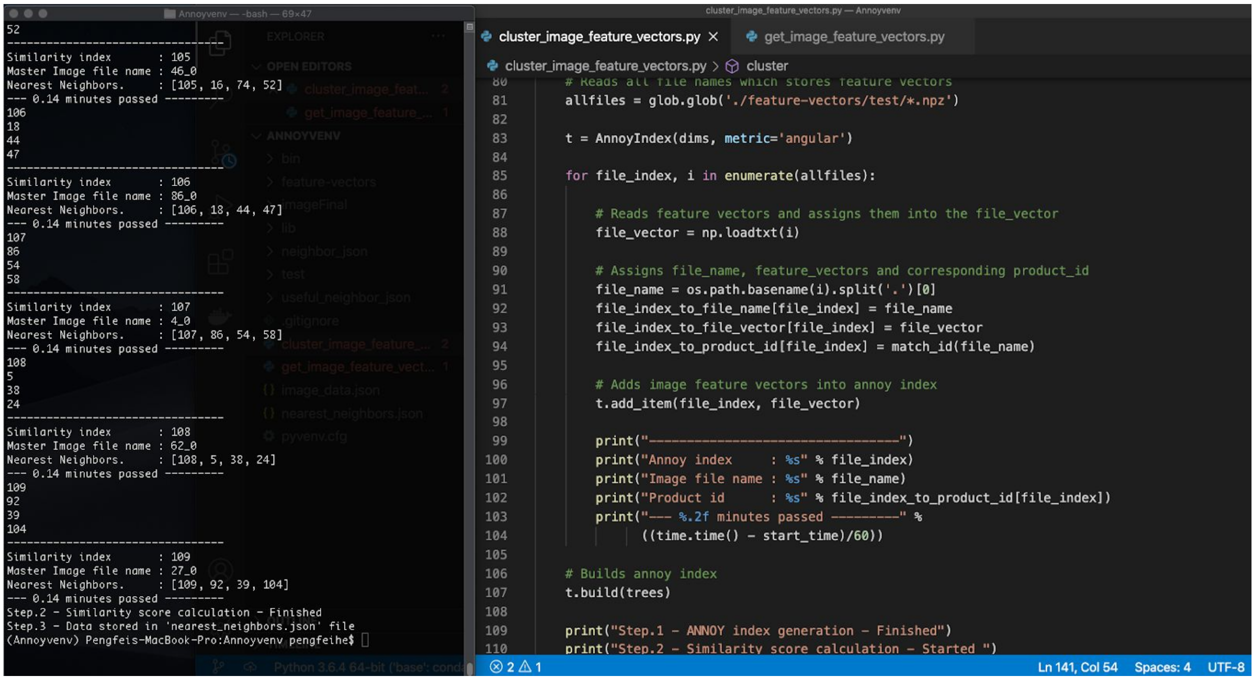
Generate N-Nearest Neighbor json file

We firstly create the vector file for each image, and then use those vectors to generate the nearest_neighbors.json file.


Annoyvenv — -bash — 73×47
get_image_feature_vectors.py — Annoyvenv
cluster_image_feature_vectors.py
get_image_feature_vectors.py
get_image_feature_vectors.py > get_image_feature_vectors
Ln 81, Col 44
Spaces: 6
UTF-8

```
Image feature vector saved to   :./feature-vectors/test/18_0.npz
-------------------------------------------------------------------------
----------------
Image count                     :103
Image in process is             :./imageFinal/79_0.jpg
Image feature vector saved to   :./feature-vectors/test/79_0.npz
-------------------------------------------------------------------------
----------------
Image count                     :104
Image in process is             :./imageFinal/84_0.jpg
Image feature vector saved to   :./feature-vectors/test/84_0.npz
-------------------------------------------------------------------------
----------------
Image count                     :105
Image in process is             :./imageFinal/44_0.jpg
Image feature vector saved to   :./feature-vectors/test/44_0.npz
-------------------------------------------------------------------------
----------------
Image count                     :106
Image in process is             :./imageFinal/46_0.jpg
Image feature vector saved to   :./feature-vectors/test/46_0.npz
-------------------------------------------------------------------------
----------------
Image count                     :107
Image in process is             :./imageFinal/86_0.jpg
Image feature vector saved to   :./feature-vectors/test/86_0.npz
-------------------------------------------------------------------------
----------------
Image count                     :108
Image in process is             :./imageFinal/4_0.jpg
Image feature vector saved to   :./feature-vectors/test/4_0.npz
-------------------------------------------------------------------------
----------------
Image count                     :109
Image in process is             :./imageFinal/27_0.jpg
Image feature vector saved to   :./feature-vectors/test/27_0.npz
-------------------------------------------------------------------------
----------------
Image count                     :110
Image in process is             :./imageFinal/62_0.jpg
Image feature vector saved to   :./feature-vectors/test/62_0.npz
----------------------------------
Step.2 of 2 - Generating Feature Vectors - Completed at Fri Jul 10 09:46:
35 2020
--- 0.27 minutes passed ---------
--- 110 images processed ---------
(Annoyvenv) Pengfeis-MacBook-Pro:Annoyvenv pengfeihe$ 
```

```python
    start_time = time.time()

    print("--------------------------------")
    print("Step.1 of 2 - mobilenet_v2_140_224 - Loading Started at %s" %
          time.ctime())
    print("--------------------------------")

    # Definition of module with using tfhub.dev handle
    module_handle = "https://tfhub.dev/google/imagenet/mobilenet_v2_140_224/feature_vector/4"

    # Load the module
    module = hub.load(module_handle)

    print("--------------------------------")
    print("Step.1 of 2 - mobilenet_v2_140_224 - Loading Completed at %s" %
          time.ctime())
    print("--- %.2f minutes passed ---------" %
          ((time.time() - start_time)/60))

    print("--------------------------------")
    print("Step.2 of 2 - Generating Feature Vectors -  Started at %s" % time.ctime())

    # Loops through all images in a local folder
    for filename in glob.glob('./imageFinal/*.jpg'):  # assuming gif
        i = i + 1

        print("---------------------------------------------------------------------------------------
        print("Image count                     :%s" % i)
        print("Image in process is             :%s" % filename)
```

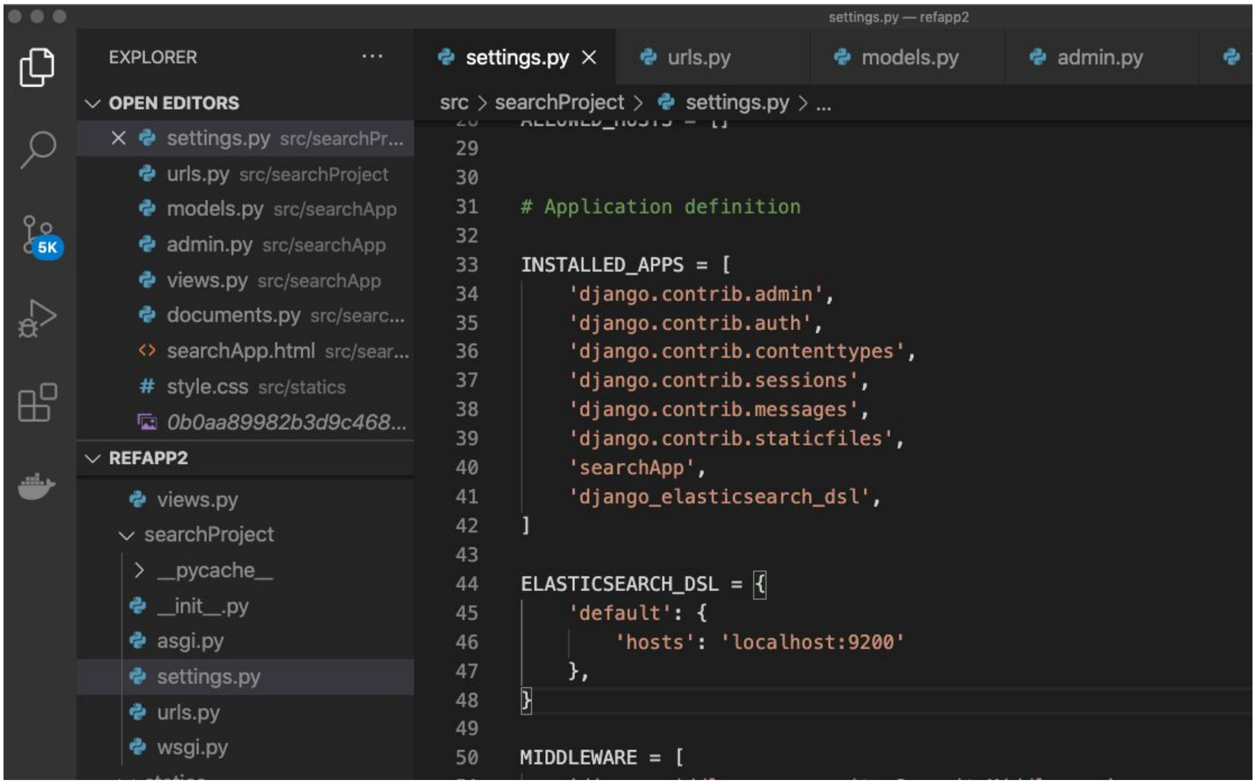

Annoyvenv — -bash — 69×47
cluster_image_feature_vectors.py — Annoyvenv
cluster_image_feature_vectors.py
get_image_feature_vectors.py
cluster_image_feature_vectors.py > cluster
Ln 141, Col 54
Spaces: 4
UTF-8

```
52
----------------------------------
Similarity index       : 105
Master Image file name : 46_0
Nearest Neighbors.     : [105, 16, 74, 52]
--- 0.14 minutes passed ---------
106
18
44
47
----------------------------------
Similarity index       : 106
Master Image file name : 86_0
Nearest Neighbors.     : [106, 18, 44, 47]
--- 0.14 minutes passed ---------
107
86
54
58
----------------------------------
Similarity index       : 107
Master Image file name : 4_0
Nearest Neighbors.     : [107, 86, 54, 58]
--- 0.14 minutes passed ---------
108
5
38
24
----------------------------------
Similarity index       : 108
Master Image file name : 62_0
Nearest Neighbors.     : [108, 5, 38, 24]
--- 0.14 minutes passed ---------
109
92
39
104
----------------------------------
Similarity index       : 109
Master Image file name : 27_0
Nearest Neighbors.     : [109, 92, 39, 104]
--- 0.14 minutes passed ---------
Step.2 - Similarity score calculation - Finished
Step.3 - Data stored in 'nearest_neighbors.json' file
(Annoyvenv) Pengfeis-MacBook-Pro:Annoyvenv pengfeihe$ 
```

```python
    # Reads all file names which stores feature vectors
    allfiles = glob.glob('./feature-vectors/test/*.npz')

    t = AnnoyIndex(dims, metric='angular')

    for file_index, i in enumerate(allfiles):

        # Reads feature vectors and assigns them into the file_vector
        file_vector = np.loadtxt(i)

        # Assigns file_name, feature_vectors and corresponding product_id
        file_name = os.path.basename(i).split('.')[0]
        file_index_to_file_name[file_index] = file_name
        file_index_to_file_vector[file_index] = file_vector
        file_index_to_product_id[file_index] = match_id(file_name)

        # Adds image feature vectors into annoy index
        t.add_item(file_index, file_vector)

        print("---------------------------------")
        print("Annoy index     : %s" % file_index)
        print("Image file name : %s" % file_name)
        print("Product id      : %s" % file_index_to_product_id[file_index])
        print("--- %.2f minutes passed ---------" %
              ((time.time() - start_time)/60))

    # Builds annoy index
    t.build(trees)

    print("Step.1 - ANNOY index generation - Finished")
    print("Step.2 - Similarity score calculation - Started ")
```

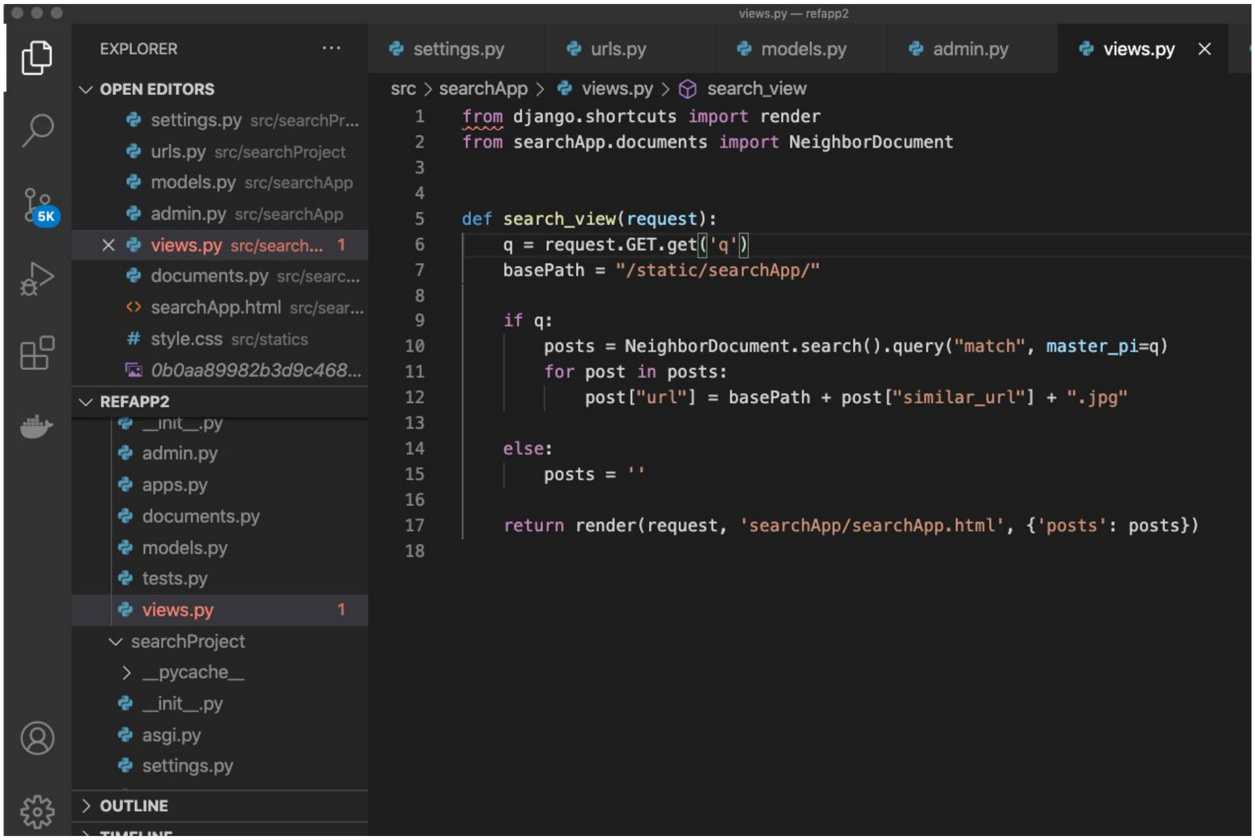
Integrate elasticsearch with django framework

We used **django-elasticsearch-dsl** for the integration. Run **python manage.py search_index --rebuild** to indexing the data model.



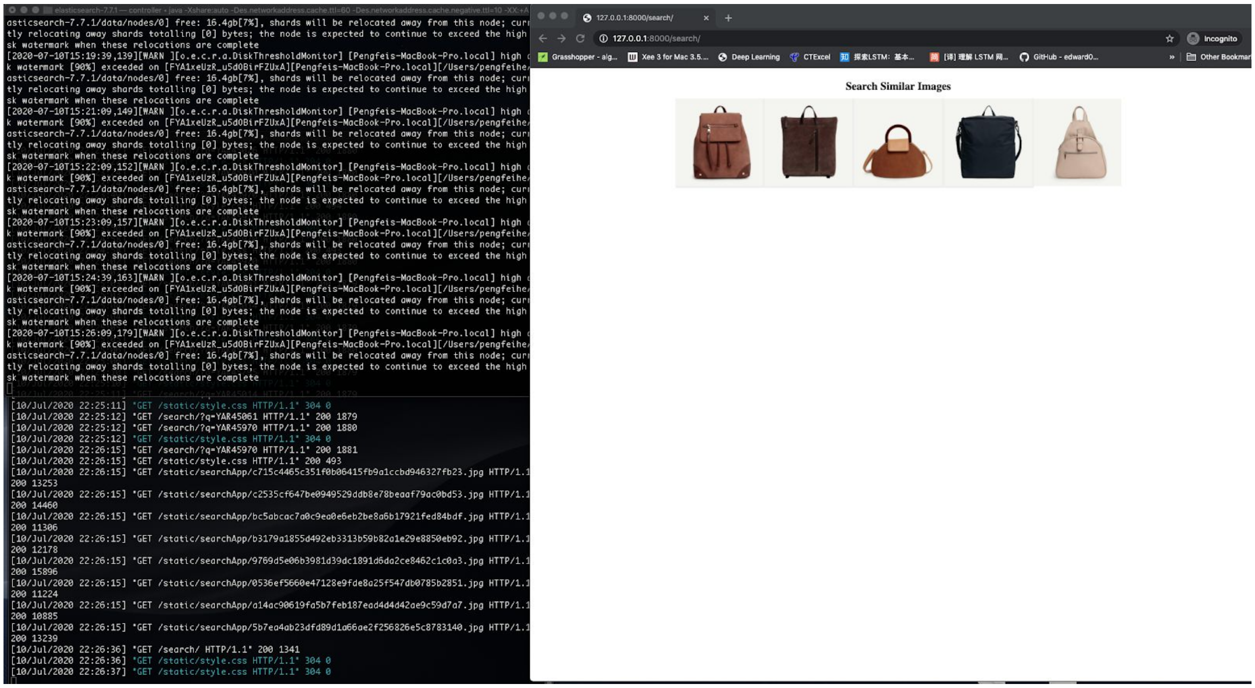
```python


# Application definition

INSTALLED_APPS = [
    'django.contrib.admin',
    'django.contrib.auth',
    'django.contrib.contenttypes',
    'django.contrib.sessions',
    'django.contrib.messages',
    'django.contrib.staticfiles',
    'searchApp',
    'django_elasticsearch_dsl',
]

ELASTICSEARCH_DSL = {
    'default': {
        'hosts': 'localhost:9200'
    },
}

MIDDLEWARE = [
```

Search based on the N-Nearest Neighbor json file



```python
from django.shortcuts import render
from searchApp.documents import NeighborDocument


def search_view(request):
    q = request.GET.get('q')
    basePath = "/static/searchApp/"

    if q:
        posts = NeighborDocument.search().query("match", master_pi=q)
        for post in posts:
            post["url"] = basePath + post["similar_url"] + ".jpg"

    else:
        posts = ''

    return render(request, 'searchApp/searchApp.html', {'posts': posts})
```

Generate UI for the app



```
asticsearch-7.7.1/data/nodes/0] free: 16.4gb[7%], shards will be relocated away from this node; curr
tly relocating away shards totalling [0] bytes; the node is expected to continue to exceed the high
sk watermark when these relocations are complete
[2020-07-10T15:19:39,139][WARN ][o.e.c.r.a.DiskThresholdMonitor] [Pengfeis-MacBook-Pro.local] high d
k watermark [90%] exceeded on [FYA1xeUzR_u5dOBirFZUxA][Pengfeis-MacBook-Pro.local][/Users/pengfeihe/
asticsearch-7.7.1/data/nodes/0] free: 16.4gb[7%], shards will be relocated away from this node; curr
tly relocating away shards totalling [0] bytes; the node is expected to continue to exceed the high
sk watermark when these relocations are complete
[2020-07-10T15:21:09,149][WARN ][o.e.c.r.a.DiskThresholdMonitor] [Pengfeis-MacBook-Pro.local] high d
k watermark [90%] exceeded on [FYA1xeUzR_u5dOBirFZUxA][Pengfeis-MacBook-Pro.local][/Users/pengfeihe/
asticsearch-7.7.1/data/nodes/0] free: 16.4gb[7%], shards will be relocated away from this node; curr
tly relocating away shards totalling [0] bytes; the node is expected to continue to exceed the high
sk watermark when these relocations are complete
[2020-07-10T15:22:09,152][WARN ][o.e.c.r.a.DiskThresholdMonitor] [Pengfeis-MacBook-Pro.local] high d
k watermark [90%] exceeded on [FYA1xeUzR_u5dOBirFZUxA][Pengfeis-MacBook-Pro.local][/Users/pengfeihe/
asticsearch-7.7.1/data/nodes/0] free: 16.4gb[7%], shards will be relocated away from this node; curr
tly relocating away shards totalling [0] bytes; the node is expected to continue to exceed the high
sk watermark when these relocations are complete
[2020-07-10T15:23:09,157][WARN ][o.e.c.r.a.DiskThresholdMonitor] [Pengfeis-MacBook-Pro.local] high d
k watermark [90%] exceeded on [FYA1xeUzR_u5dOBirFZUxA][Pengfeis-MacBook-Pro.local][/Users/pengfeihe/
asticsearch-7.7.1/data/nodes/0] free: 16.4gb[7%], shards will be relocated away from this node; curr
tly relocating away shards totalling [0] bytes; the node is expected to continue to exceed the high
sk watermark when these relocations are complete
[2020-07-10T15:24:39,163][WARN ][o.e.c.r.a.DiskThresholdMonitor] [Pengfeis-MacBook-Pro.local] high d
k watermark [90%] exceeded on [FYA1xeUzR_u5dOBirFZUxA][Pengfeis-MacBook-Pro.local][/Users/pengfeihe/
asticsearch-7.7.1/data/nodes/0] free: 16.4gb[7%], shards will be relocated away from this node; curr
tly relocating away shards totalling [0] bytes; the node is expected to continue to exceed the high
sk watermark when these relocations are complete
[2020-07-10T15:26:09,179][WARN ][o.e.c.r.a.DiskThresholdMonitor] [Pengfeis-MacBook-Pro.local] high d
k watermark [90%] exceeded on [FYA1xeUzR_u5dOBirFZUxA][Pengfeis-MacBook-Pro.local][/Users/pengfeihe/
asticsearch-7.7.1/data/nodes/0] free: 16.4gb[7%], shards will be relocated away from this node; curr
tly relocating away shards totalling [0] bytes; the node is expected to continue to exceed the high
sk watermark when these relocations are complete
```

```
[10/Jul/2020 22:25:11] "GET /static/style.css HTTP/1.1" 304 0
[10/Jul/2020 22:25:12] "GET /search/?q=YAR45061 HTTP/1.1" 200 1879
[10/Jul/2020 22:25:12] "GET /search/?q=YAR45970 HTTP/1.1" 200 1880
[10/Jul/2020 22:25:12] "GET /static/style.css HTTP/1.1" 304 0
[10/Jul/2020 22:26:15] "GET /search/?q=YAR45970 HTTP/1.1" 200 1881
[10/Jul/2020 22:26:15] "GET /static/style.css HTTP/1.1" 200 493
[10/Jul/2020 22:26:15] "GET /static/searchApp/c715c4465c351f0b06415fb9a1ccbd946327fb23.jpg HTTP/1.1
200 13253
[10/Jul/2020 22:26:15] "GET /static/searchApp/c2535cf647be0949529ddb8e78beaaf79ac0bd53.jpg HTTP/1.1
200 14460
[10/Jul/2020 22:26:15] "GET /static/searchApp/bc5abcac7a0c9ea0e6eb2be8a6b17921fed84bdf.jpg HTTP/1.1
200 11306
[10/Jul/2020 22:26:15] "GET /static/searchApp/b3179a1855d492eb3313b59b82a1e29e8850eb92.jpg HTTP/1.1
200 12178
[10/Jul/2020 22:26:15] "GET /static/searchApp/9769d5e06b3981d39dc1891d6da2ce8462c1c0a3.jpg HTTP/1.1
200 15896
[10/Jul/2020 22:26:15] "GET /static/searchApp/0536ef5660e47128e9fde8a25f547db0785b2851.jpg HTTP/1.1
200 11224
[10/Jul/2020 22:26:15] "GET /static/searchApp/a14ac90619fa5b7feb187ead4d42ae9c59d7a7.jpg HTTP/1.1
200 10885
[10/Jul/2020 22:26:15] "GET /static/searchApp/5b7ea4ab23dfd89d1a66ae2f256826e5c8783140.jpg HTTP/1.1
200 13239
[10/Jul/2020 22:26:36] "GET /search/ HTTP/1.1" 200 1341
[10/Jul/2020 22:26:36] "GET /static/style.css HTTP/1.1" 304 0
[10/Jul/2020 22:26:37] "GET /static/style.css HTTP/1.1" 304 0
```