

Setup Instructions and inference Document

Setup Instructions:

Overview: This document outlines the steps required to set up the Stylelens on your local machine. Please follow these instructions carefully to ensure a smooth installation process.




Prerequisites

1. Operating System: Windows, macOS, Ubuntu
2. Python Version: Python 3.11
3. Internet Connection for downloading dependencies.
4. Docker latest version
5. Stylens source code
6. VSCode
7. EC2 Instance type for Training: g4dn.12xlarge
8. Volume size minimum 200GB

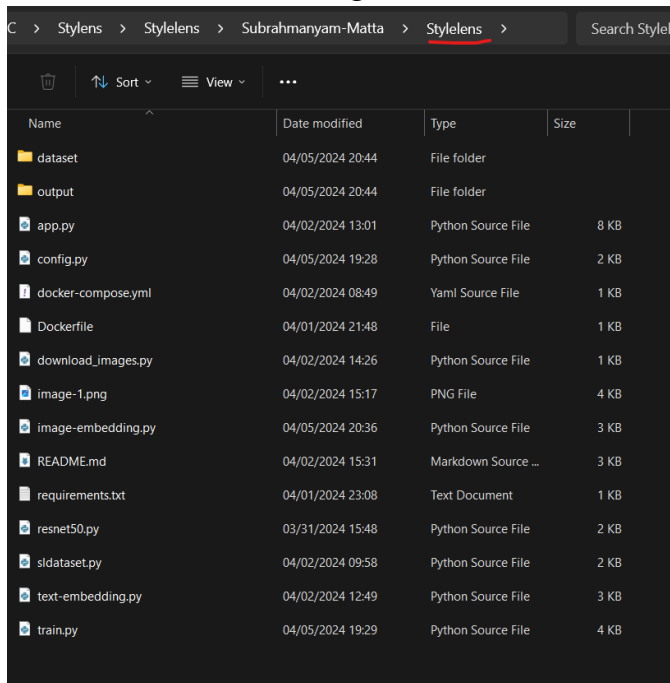
Installation Steps:

Stylens Source Folder:

1. Download the source code from attached Stylens folder and place it.

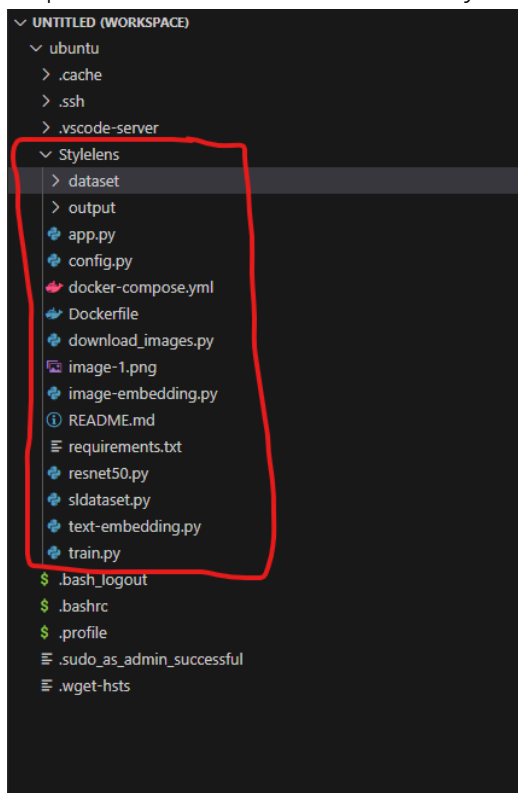
| Name | Date modified | Type | Size |
|---|------------------|---------------------|----------|
|  Stylens | 04/05/2024 20:44 | File folder | |
|  SolutionDocumentation.pdf | 04/06/2024 16:05 | Adobe Acrobat D... | 600 KB |
|  Stylens_EDA_and_DataPreparation.ipynb | 04/05/2024 20:45 | Jupyter Source File | 1,133 KB |

Folder contains following files:



| Name | Date modified | Type | Size |
|--------------------|------------------|---------------------|------|
| dataset | 04/05/2024 20:44 | File folder | |
| output | 04/05/2024 20:44 | File folder | |
| app.py | 04/02/2024 13:01 | Python Source File | 8 KB |
| config.py | 04/05/2024 19:28 | Python Source File | 2 KB |
| docker-compose.yml | 04/02/2024 08:49 | Yaml Source File | 1 KB |
| Dockerfile | 04/01/2024 21:48 | File | 1 KB |
| download_images.py | 04/02/2024 14:26 | Python Source File | 1 KB |
| image-1.png | 04/02/2024 15:17 | PNG File | 4 KB |
| image-embedding.py | 04/05/2024 20:36 | Python Source File | 3 KB |
| README.md | 04/02/2024 15:31 | Markdown Source ... | 3 KB |
| requirements.txt | 04/01/2024 23:08 | Text Document | 1 KB |
| resnet50.py | 03/31/2024 15:48 | Python Source File | 2 KB |
| sldataset.py | 04/02/2024 09:58 | Python Source File | 2 KB |
| text-embedding.py | 04/02/2024 12:49 | Python Source File | 3 KB |
| train.py | 04/05/2024 19:29 | Python Source File | 4 KB |

2. Open VS Code and load the Stylelens folder:



1. Check python version:

```
python3 --version
```

Check python is installed in your system if not please go ahead and install python 3.11

Install steps: <https://www.linuxcapable.com/how-to-install-python-3-11-on-ubuntu-linux/>

2. if pip has not installed in your system

```
sudo apt install python3-venv
```

3. Alias python name

```
alias python='python3'
```

4. Create Virtual Environment: If desired, create a virtual environment using the following command:

```
python -m venv stylelensve
```

5. Activate Virtual Environment : Activate the virtual environment based on your operating system:

```
source stylelensve/bin/activate
```

6. Go to project directory

```
cd Stylelens/
```

7. Install Dependencies: Install the required dependencies using the following command:

```
pip install -r requirements.txt
```

```
• (stylelensve) ubuntu@ip-172-31-43-195:~$ cd Stylelens/  
○ (stylelensve) ubuntu@ip-172-31-43-195:~/Stylelens$ pip install -r requirements.txt  
Looking in indexes: https://pypi.org/simple, https://download.pytorch.org/whl/cu116  
Collecting lshashpy3==0.0.9
```

8. Download image folder (must done: Prerequisites for training, inference and embedding):

Download images from google drive using script or manually.

Make sure you have gdown installed on your machine. If not, please install it.

```
pip install gdown -U --no-cache-dir
```

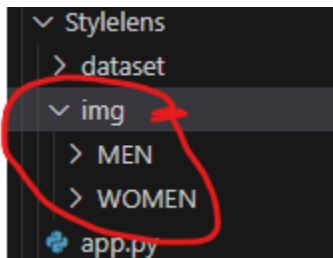
```
(stylelensve) ubuntu@ip-172-31-43-195:~/Stylelens$ pip install gdown -U --no-cache-dir
Collecting gdown
  Downloading gdown-5.1.0-py3-none-any.whl (17 kB)
Requirement already satisfied: filelock in /home/ubuntu/stylelensve/lib/python3.10/site-packages (from gdown)
Installing collected packages: gdown
Successfully installed gdown-5.1.0
```

Run script to download images

```
python download_images.py
```

```
(stylelensve) ubuntu@ip-172-31-43-195:~/Stylelens$ python download_images.py
Downloading...
From (original): https://drive.google.com/uc?id=1SIE6hs3mtc9Kh17gauHuWfELeUOMojPD&export=download
From (redirected): https://drive.google.com/uc?id=1SIE6hs3mtc9Kh17gauHuWfELeUOMojPD&export=download&confirm=t&uiid=9305bcb2-fafc-4fea-8039-6e8c122abdfe
To: /home/ubuntu/Stylelens/img.zip
100%|#####| 831M/831M [00:00<00:00, 101MB/s]
(stylelensve) ubuntu@ip-172-31-43-195:~/Stylelens$
```

After download image files will be available under project directory :



Or you can download manually images using link

<https://drive.google.com/uc?id=1SIE6hs3mtc9Kh17gauHuWfELeUOMojPD&export=download>

Run script to download model files (must done step)

```
python download_model_files.py
```

```
(stylelensve) ubuntu@ip-172-31-43-195:~/Stylelens$ python download_model_files.py
Downloading...
From (original): https://drive.google.com/uc?export=download&id=1w_8p20-0wmX2UCLFnBLsisr1LRlBUDmM
From (redirected): https://drive.google.com/uc?export=download&id=1w_8p20-0wmX2UCLFnBLsisr1LRlBUDmM&confirm=t&uiid=525d7166-fb1f-4e98-b700-878d44b07cc9
To: /home/ubuntu/Stylelens/output.zip
100%|#####| 124M/124M [00:00<00:00, 151MB/s]
(stylelensve) ubuntu@ip-172-31-43-195:~/Stylelens$
```

Model files link:

https://drive.google.com/uc?export=download&id=1w_8p20-0wmX2UCLFnBLsisr1LRlBUDmM

Run web app using this point.

`streamlit run app.py`

```
(stylelensve) ubuntu@ip-172-31-43-195:~/Stylelens$ streamlit run app.py
Collecting usage statistics. To deactivate, set browser.gatherUsageStats to False.

You can now view your Streamlit app in your browser.

Network URL: http://172.31.43.195:8501
External URL: http://52.90.142.4:8501
```

Inference Steps – Using Docker

Building the docker image:

(Note: Run as administrator on Windows and remove "sudo" in commands)

1. Important - Make sure you have installed Docker and Docker-compose on your PC:

- Linux: Docker
- Windows/Mac: Docker Desktop

Link: <https://docs.docker.com/engine/install/ubuntu/>

2. Start Docker:

- Linux (Home Directory):

`sudo systemctl start docker`

```
(stylelensve) ubuntu@ip-172-31-92-121:~$ sudo systemctl start docker
```

- Windows: You can start Docker engine from Docker Desktop.

3. Build Docker image from the project directory:

`sudo docker-compose build`

```
(stylelensve) ubuntu@ip-172-31-92-121:~/Stylelens$ sudo systemctl start docker
(stylelensve) ubuntu@ip-172-31-92-121:~/Stylelens$ sudo docker-compose build
Building webapp
[+] Building 223.4s (9/9) FINISHED
=> [internal] load build definition from dockerfile
=> => transferring dockerfile: 835B
=> [internal] load metadata for docker.io/library/python:3.11.8
=> [internal] load .dockerignore
=> => transferring context: 2B
=> [internal] load build context
=> => transferring context: 1.92GB
=> CACHED [1/4] FROM docker.io/library/python:3.11.8@sha256:61d662f6d52286ab2290af4258257b5369573b6a4bbd904896699cc909221334
=> [2/4] COPY . /app
=> [3/4] WORKDIR /app
=> [4/4] RUN pip install -r requirements.txt
=> exporting to image
=> => exporting layers
=> => writing image sha256:cc836d51089e7251ae2bf6b121124af7a0a312fe3a50844e911714aa11e3f680
=> => naming to docker.io/library/stylelens_webapp
0.0s
(stylelensve) ubuntu@ip-172-31-92-121:~/Stylelens$
```

Running the container:

1. Start a container:

```
sudo docker-compose up
```

```
(stylelensve) ubuntu@ip-172-31-92-121:~/Stylelens$ sudo docker-compose up
Creating network "stylelens_default" with the default driver
Creating stylelens_webapp_1 ... done
Attaching to stylelens_webapp_1
webapp_1 |
webapp_1 | Collecting usage statistics. To deactivate, set browser.gatherUsageStats to False.
webapp_1 |
webapp_1 | You can now view your Streamlit app in your browser.
webapp_1 |
webapp_1 | URL: http://0.0.0.0:8501
webapp_1 |
```

| PORTS 1 | | |
|---------------------------|-------------------|-----------------|
| Port | Forwarded Address | Running Process |
| 8501 | localhost:8501 | |
| <button>Add Port</button> | | |

2. This will display the URL to access the Stylelens Streamlit app (<http://0.0.0.0:8501>).

Note that this URL may not work on Windows. For Windows, go to

<http://localhost:8501/>

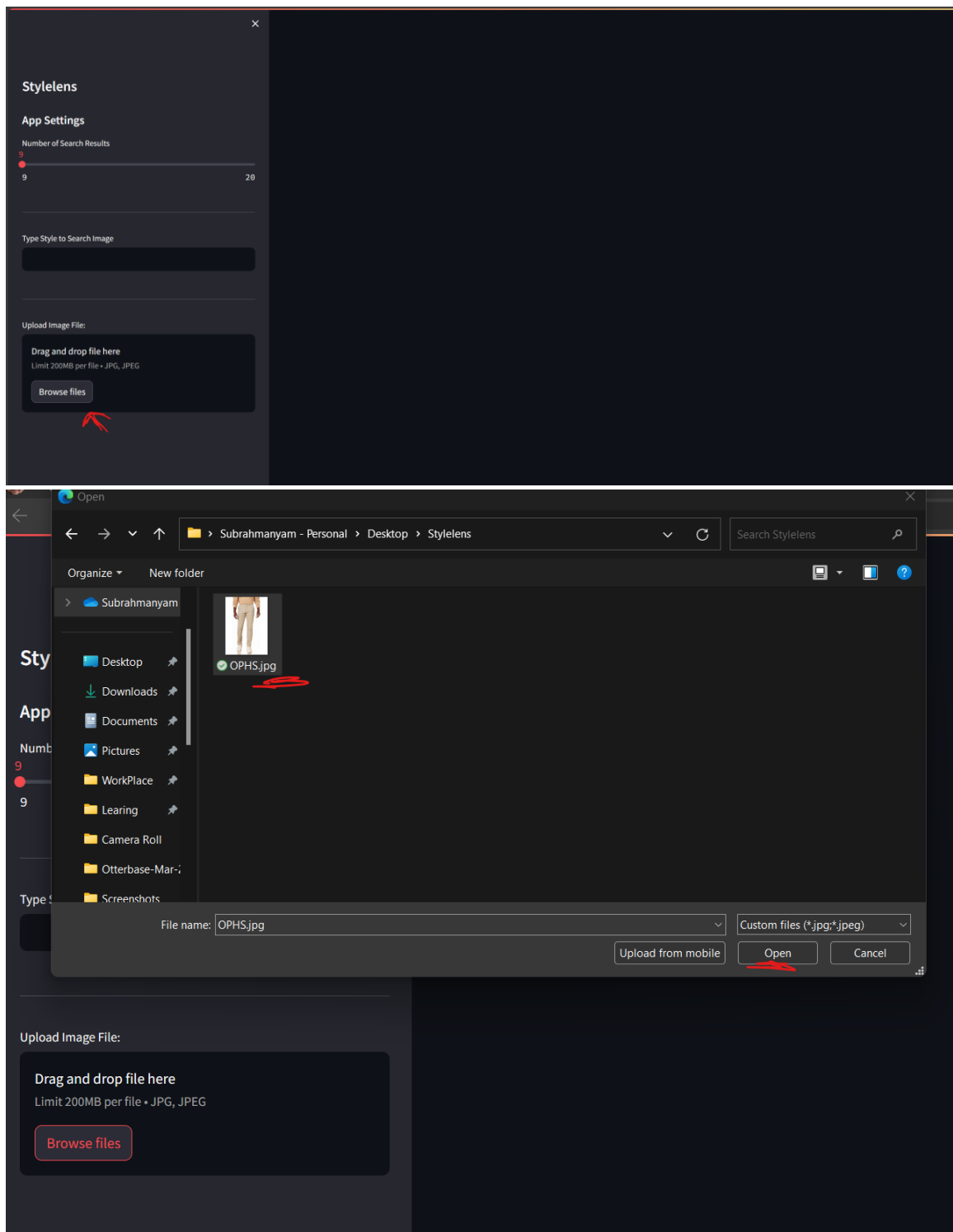
Stop docker:

```
sudo docker-compose down
```

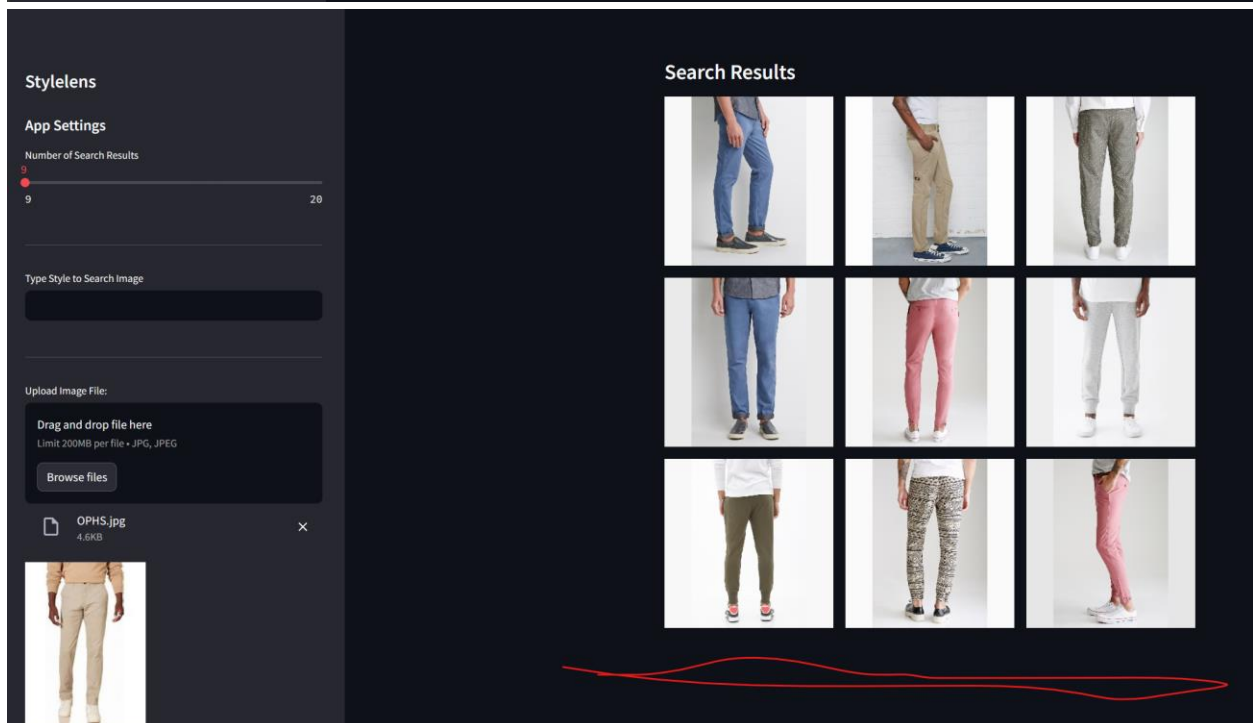
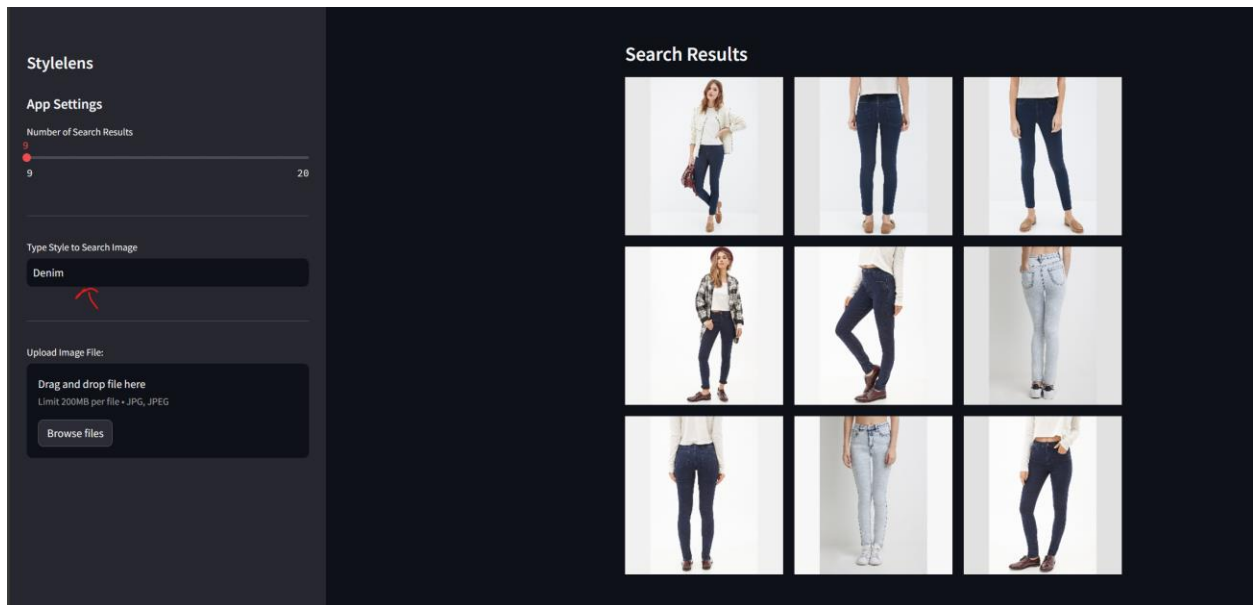
```
(stylelensve) ubuntu@ip-172-31-92-121:~/Stylelens$ sudo docker-compose down
Removing stylelens_webapp_1 ... done
Removing network stylelens_default
```

How to Use Stylelens:

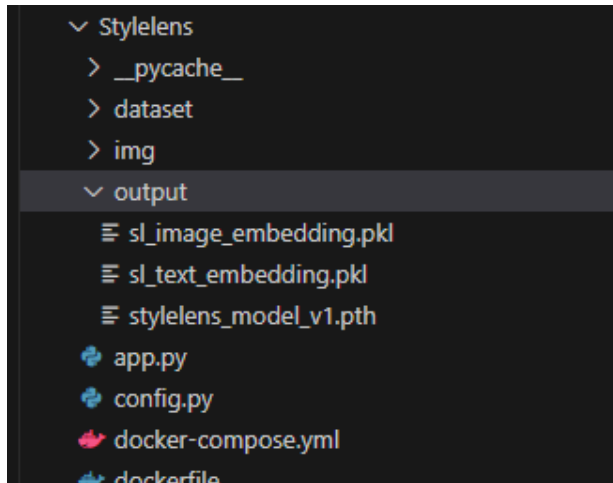
Select image from browse folder or drag and drop to find the similar image.



Text Search:

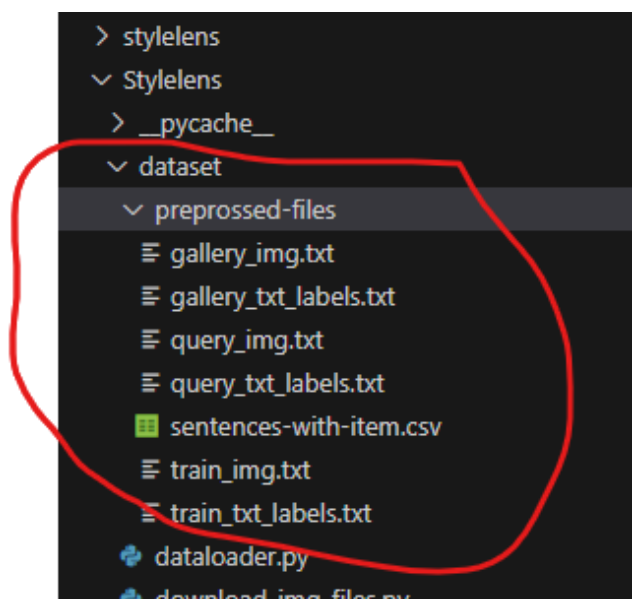


Follow the steps below if you're not seeing the model and embedding files in the output folder:



1. Data Preparation: go to the dataset folder and run following to code to prepare dataset:

python dataloader.py

[illegible]

Fine tune ResNet50 Model the Stylens app on local:

2. Train model locally:

`python train.py`

```
(stylelens) ubuntu@ip-172-31-92-121:~/Stylelens$ python train.py
train data set prepared 25881
val data set prepared 14217
model creating
/home/ubuntu/stylelens/lib/python3.11/site-packages/torchvision/models/_utils.py:208: UserWarning: The parameter 'pretrained' is deprecated since 0.13 and may be removed in the future, please use 'weights' instead.
  warnings.warn(
/home/ubuntu/stylelens/lib/python3.11/site-packages/torchvision/models/_utils.py:223: UserWarning: Arguments other than a weight enum or 'None' for 'weights' are deprecated since 0.13 and may be removed in the future. The current behavior is equivalent to passing 'weights=ResNet50_Weights.IMAGENET1K_V1'. You can also use 'weights=ResNet50_Weights.DEFAULT' to get the most up-to-date weights.
  warnings.warn(msg)
model created
training start
556it [03:10, 2.95it/s]
```

3. create a Image Embedding and store in pickle file (sl_image_embedding.pkl):

`python image-embedding.py`

```
(stylelens) ubuntu@ip-172-31-92-121:~/Stylelens$ python image-embedding.py
/home/ubuntu/stylelens/lib/python3.11/site-packages/torchvision/models/_utils.py:208: UserWarning: The parameter 'pretrained' is deprecated since 0.13 and may be removed in the future, please use 'weights' instead.
  warnings.warn(
/home/ubuntu/stylelens/lib/python3.11/site-packages/torchvision/models/_utils.py:223: UserWarning: Arguments other than a weight enum or 'None' for 'weights' are deprecated since 0.13 and may be removed in the future. The current behavior is equivalent to passing 'weights=ResNet50_Weights.IMAGENET1K_V1'. You can also use 'weights=ResNet50_Weights.DEFAULT' to get the most up-to-date weights.
  warnings.warn(msg)
model loaded!!
4% |██████████| 1079/25881 [00:29<11:16, 36.68it/s]
```

4. create a Text Embedding and store in pickle file (sl_text_embedding.pkl):

`python text-embedding.py`

```
(stylelens) ubuntu@ip-172-31-92-121:~/Stylelens$ python text-embedding.py
modules.json: 100% |██████████| 349/349 [00:00<00:00, 3.22MB/s]
config_sentence_transformers.json: 100% |██████████| 116/116 [00:00<00:00, 1.31MB/s]
README.md: 100% |██████████| 10.7k/10.7k [00:00<00:00, 75.0MB/s]
sentence_bert_config.json: 100% |██████████| 53.0/53.0 [00:00<00:00, 447kB/s]
config.json: 100% |██████████| 612/612 [00:00<00:00, 7.33MB/s]
model.safetensors: 100% |██████████| 90.9M/90.9M [00:00<00:00, 33.8MB/s]
tokenizer_config.json: 100% |██████████| 350/350 [00:00<00:00, 3.66MB/s]
vocab.txt: 100% |██████████| 232k/232k [00:00<00:00, 42.0MB/s]
tokenizer.json: 100% |██████████| 466k/466k [00:00<00:00, 33.1MB/s]
special_tokens_map.json: 100% |██████████| 112/112 [00:00<00:00, 1.64MB/s]
1_Pooling/config.json: 100% |██████████| 190/190 [00:00<00:00, 2.37MB/s]
extracted image path
3% |██████████| 788/25881 [00:13<07:23, 56.58it/s]

(stylelens) ubuntu@ip-172-31-92-121:~/Stylelens$ python text-embedding.py
extracted image path
100% |██████████| 25881/25881 [07:34<00:00, 56.94it/s]
Encoded images
Saving text embeddings
(stylelens) ubuntu@ip-172-31-92-121:~/Stylelens$
```