```
import numpy as np # linear algebra
import pandas as pd # data processing, CSV file I/O (e.g. pd.read_csv)
import matplotlib.pyplot as plt
import os
for dirname, _, filenames in os.walk('/content/drive'):
    for filename in filenames:
        os.path.join(dirname, filename)
```

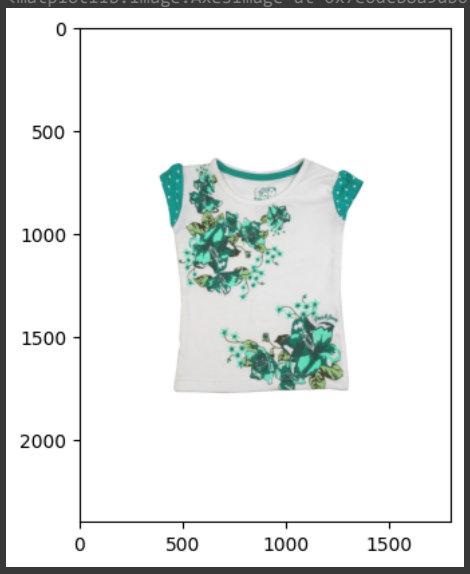
```
dataset = pd.read_csv('/content/drive/MyDrive/Colab Notebooks/Dataset/fashion.csv')
dataset.head()
```

	ProductId	Gender	Category	SubCategory	ProductType	Colour	Usage	ProductTi
0	42419	Girls	Apparel	Topwear	Tops	White	Casual	Gini and J Girls White
1	34009	Girls	Apparel	Topwear	Tops	Black	Casual	Gini and J Girls B
2	40143	Girls	Apparel	Topwear	Tops	Blue	Casual	Gini and J Girls P Blossom

```
import cv2
from skimage.io import imread
import tensorflow as tf
from keras.applications.resnet import ResNet50, preprocess_input
from keras.layers import GlobalMaxPooling2D
from numpy.linalg import norm
import pickle
from sklearn.neighbors import NearestNeighbors
```

```
a = imread(dataset['ImageURL'][0])
plt.imshow(a)
```

```
<matplotlib.image.AxesImage at 0x7e0dcb8a9db0>
```




```
model = ResNet50(weights = 'imagenet', input_shape = (224,224, 3), include_top = False)
model.trainable = False
model = tf.keras.Sequential([
    model,
    GlobalMaxPooling2D()
])
model.save('model_file.h5')
model.summary()
```

```
/usr/local/lib/python3.10/dist-packages/keras/src/engine/training.py:3103: UserWarning:

You are saving your model as an HDF5 file via `model.save()`. This file format is considered legacy. We recommend using instead the

WARNING:tensorflow:Compiled the loaded model, but the compiled metrics have yet to be built. `model.compile_metrics` will be empty
Model: "sequential_3"
_________________________________________________________________
 Layer (type)                Output Shape              Param #
=================================================================
 resnet50 (Functional)       (None, 7, 7, 2048)        23587712
```

```
 global_max_pooling2d_3 (Gl  (None, 2048)              0
 obalMaxPooling2D)

=================================================================
Total params: 23587712 (89.98 MB)
Trainable params: 0 (0.00 Byte)
Non-trainable params: 23587712 (89.98 MB)
_________________________________________________________________
```

```
def extract_features_from_img(img_path, model) :
    print(type(img_path))
    img = imread(img_path)
    img = cv2.resize(img, (224,224))
    img = np.array(img)
    img_expanded = np.expand_dims(img, axis = 0)
    preprocessed = preprocess_input(img_expanded)
    result = model.predict(preprocessed).flatten()
    normalised = result / norm(result)
    return normalised
```

```
filenames = dataset['ImageURL'].to_list()
```

```
'''import tqdm
features = []
for file in filenames:
    features.append(extract_features_from_img(file, model))
print(len(features))'''
```

```
'import tqdm\nfeatures = []\nfor file in filenames:\n    features.append(extract_
features.from_img(file, model))\nprint(len(features))'
```

```
'''ss = pickle.dumps(features)
with open('file.pkl', 'wb') as file:
    # A new file will be created
    pickle.dump(features, file)'''
```

```
'ss = pickle.dumps(features)\nwith open('file.pkl', 'wb') as file:\n    # A new f
ile will be created\n    pickle.dump(features, file)'
```

```
import os
# Define the file path
file_path = '/content/drive/MyDrive/MyFiles/file.pkl'
```

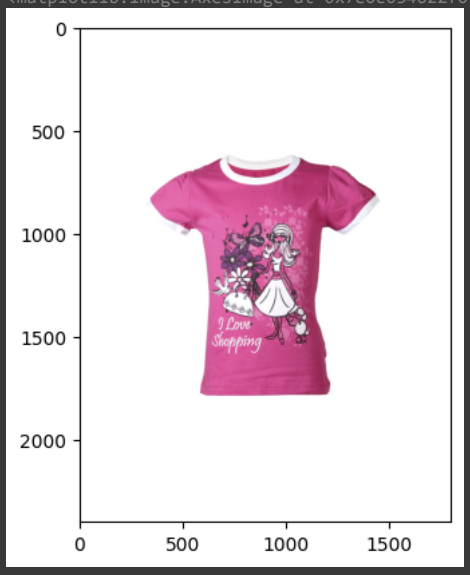
```
import pickle
# Your existing code for extracting features
import tqdm

features = []
for file in filenames:
    features.append(extract_features_from_img(file, model))

# Save the pickled file
with open(file_path, 'wb') as file:
    pickle.dump(features, file)
```

```
a = imread(filenames[3])
plt.imshow(a)
```

```
<matplotlib.image.AxesImage at 0x7e0e034622f0>
```

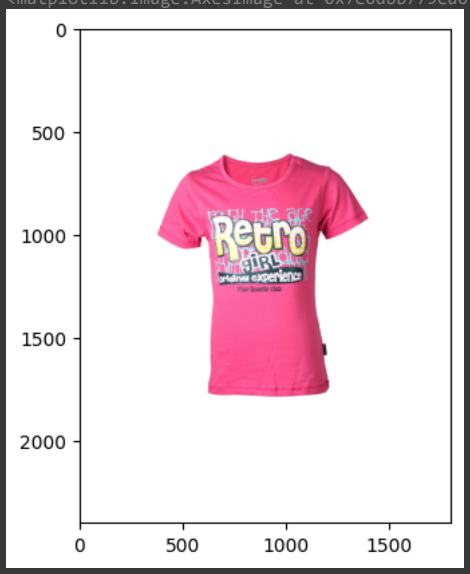



```
1 from sklearn.neighbors import NearestNeighbors
2 neighbours = NearestNeighbors(n_neighbors = 5, algorithm = 'brute', metric = 'euclidean')
3 neighbours.fit(features)
4 distance, indices = neighbours.kneighbors([extract_features_from_img(filenames[3], model)])
```

```
<class 'str'>
1/1 [==============================] - 0s 184ms/step
```

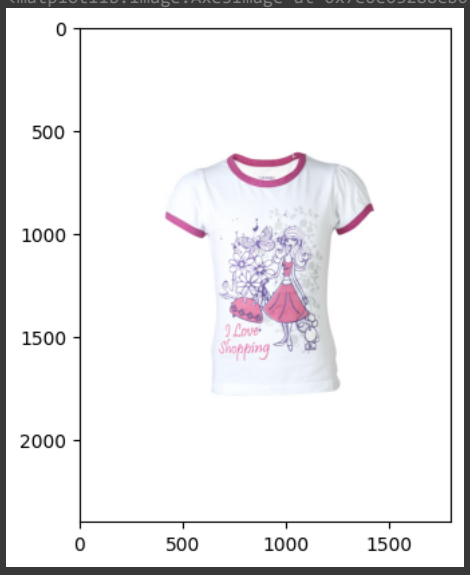
```
1 img1 = imread(filenames[indices[0][1]])
2 plt.imshow(img1)
```

```
<matplotlib.image.AxesImage at 0x7e0dbb779ea0>
```




```
1 img2 = imread(filenames[indices[0][2]])
2 plt.imshow(img2)
```

```
<matplotlib.image.AxesImage at 0x7e0e03288eb0>
```




```
1 img3 = imread(filenames[indices[0][3]])
2 plt.imshow(img3)
```

```
<matplotlib.image.AxesImage at 0x7e0dcb85ff40>
```