

Thao Vy Tran

EE 104

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Please watch this link for CNN: <https://youtu.be/zEFB9GVN1YU>

Link video: <https://youtu.be/Axn6WqiNRaA>

Lab 6 includes five tasks as below: First, we need to set up and import important packages

I.CNN

- Download CIFAR-10 dataset

- Import important packages

pip install tensorflow

pip install keras

pip install h5py

pip install Matplotlib

pip install numpy

How to use

Run CNNbaseline.py file, the maximum accuracy we can get is shown as below:

Model summary

Layer (type)	Output Shape	Param #
conv2d (Conv2D)	(None, 32, 32, 32)	896
batch_normalization (Batch Normalization)	(None, 32, 32, 32)	128
conv2d_1 (Conv2D)	(None, 32, 32, 32)	9248
batch_normalization_1 (Batch Normalization)	(None, 32, 32, 32)	128
max_pooling2d (MaxPooling2D)	(None, 16, 16, 32)	0
dropout (Dropout)	(None, 16, 16, 32)	0
conv2d_2 (Conv2D)	(None, 16, 16, 64)	18496
batch_normalization_2 (Batch Normalization)	(None, 16, 16, 64)	256
conv2d_3 (Conv2D)	(None, 16, 16, 64)	36928
batch_normalization_3 (Batch Normalization)	(None, 16, 16, 64)	256
max_pooling2d_1 (MaxPooling2D)	(None, 8, 8, 64)	0
dropout_1 (Dropout)	(None, 8, 8, 64)	0
conv2d_4 (Conv2D)	(None, 8, 8, 128)	73856
batch_normalization_4 (Batch Normalization)	(None, 8, 8, 128)	512
conv2d_5 (Conv2D)	(None, 8, 8, 128)	147584
batch_normalization_5 (Batch Normalization)	(None, 8, 8, 128)	512
max_pooling2d_2 (MaxPooling2D)	(None, 4, 4, 128)	0

dropout_2 (Dropout)	(None, 4, 4, 128)	0
flatten (Flatten)	(None, 2048)	0
dense (Dense)	(None, 240)	491760
batch_normalization_6 (Batch Normalization)	(None, 240)	960
dropout_3 (Dropout)	(None, 240)	0
dense_1 (Dense)	(None, 10)	2410
=====		
Total params: 783,930		
Trainable params: 782,554		
Non-trainable params: 1,376		

```

Spyder (Python 3.9)
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D:\Thao Vy\2023\spring 2023\EE 104\lab\module 5 neural network\CNNbaseline.py

wax2car.py x Happy Garden.py x untitled2.py x test_image.py x ChatGTP_LoopQuery.py x ChatGTP_SMS.py x CNNbaseline.py x

58 model.add(layers.Conv2D(64, (3, 3), activation='relu', padding='same'))
59 model.add(layers.BatchNormalization())
60 model.add(layers.MaxPooling2D((2, 2)))
61 model.add(layers.Dropout(0.3))
62
63 model.add(layers.Conv2D(128, (3, 3), activation='relu', padding='same'))
64 model.add(layers.BatchNormalization())
65 model.add(layers.Conv2D(128, (3, 3), activation='relu', padding='same'))
66 model.add(layers.BatchNormalization())
67 model.add(layers.MaxPooling2D((2, 2)))
68 model.add(layers.Dropout(0.4))
69
70 # Add Dense layers on top
71 model.add(layers.Flatten())
72 model.add(layers.Dense(240, activation='relu'))
73 model.add(layers.BatchNormalization())
74 model.add(layers.Dropout(0.5))
75 model.add(layers.Dense(10))
76
77 # Here's the complete architecture of your model:
78 model.summary()
79
80 ## End code from https://colab.research.google.com/github/tensorflow/docs/blob/master/site/en/tutorials
81 #####
82
83 # Use the Adam optimizer instead of SGD
84 optimizer = Adam(learning_rate=0.001)
85
86 # Compile the model with the Adam optimizer
87 model.compile(optimizer=optimizer,
88              loss=tf.keras.losses.SparseCategoricalCrossentropy(from_logits=True),
89              metrics=['accuracy'])
90
91 history = model.fit(train_images, train_labels, epochs=20,
92                    validation_data=(test_images, test_labels))
93
94 ## Evaluate the model
95 plt.plot(history.history['accuracy'], label='accuracy')
96 plt.plot(history.history['val_accuracy'], label='val_accuracy')
97 plt.xlabel('epoch')
98 plt.ylabel('Accuracy')
99 plt.ylim([0.5, 1])
100 plt.legend(loc='lower right')
101
102 test_loss, test_acc = model.evaluate(test_images, test_labels, verbose=2)
103 print(test_acc)
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```

After running the CNNbaseline.py, we can use the model generated to run the test_image.py

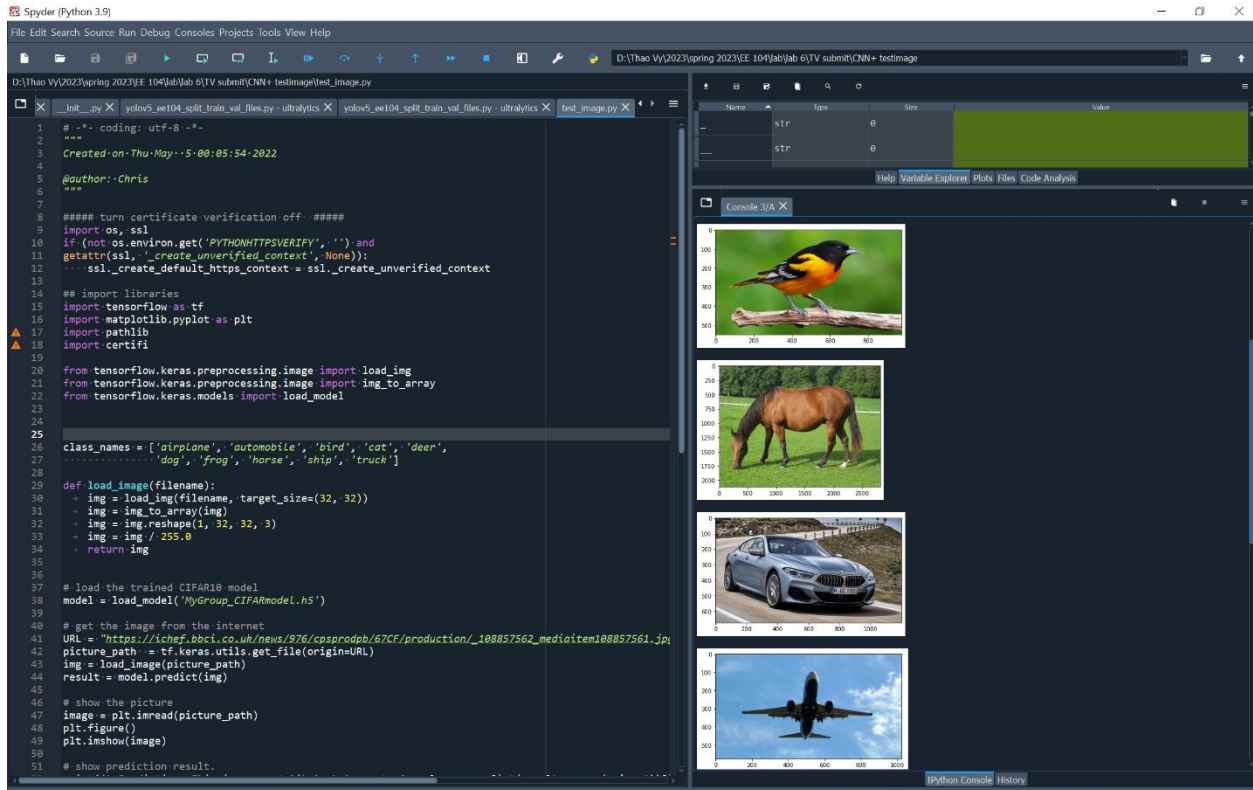
3.Game Development

```
import pgzrun
```

```
from random import *
```

```
import time
```

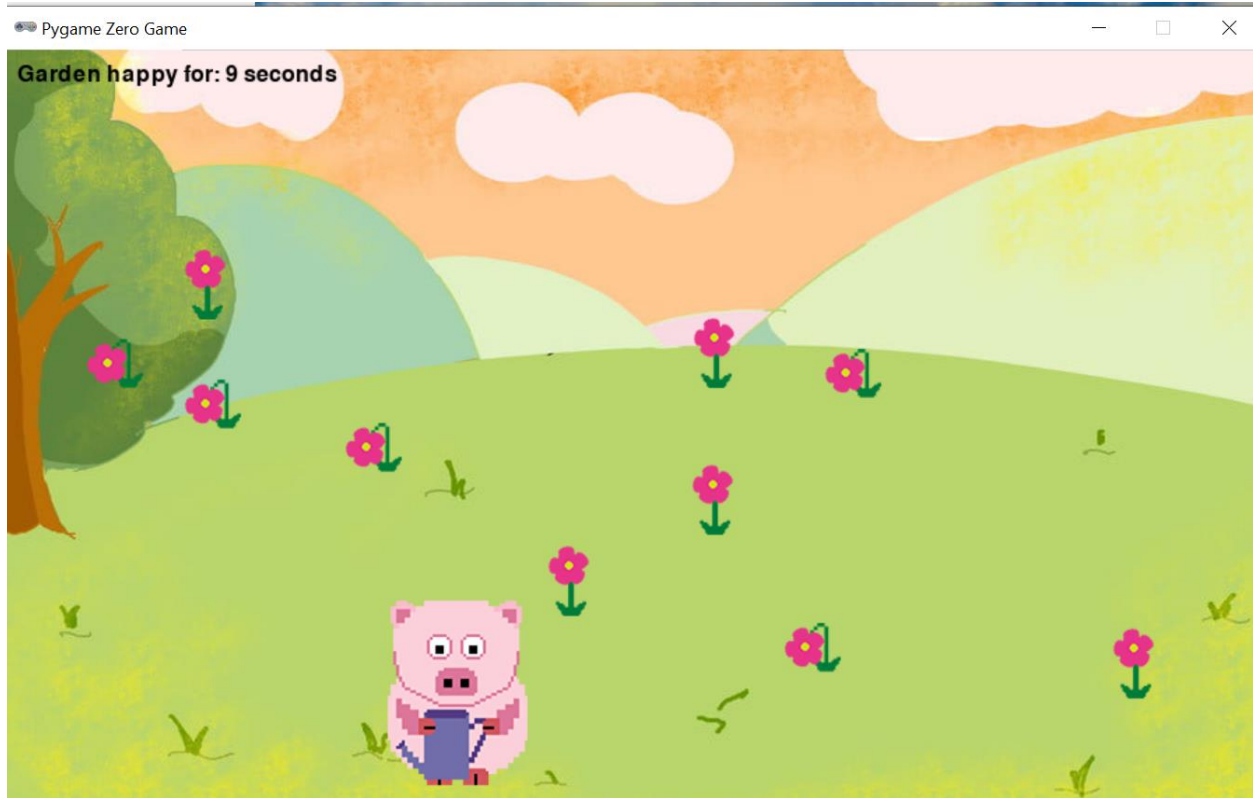
Save the CNNbaseline model is generated then test these four images



3.Game Development- Happy Garden

Move the pig and wilt the flower by click the SPACE button to wilt the flower.

When the owl or the fangglower attack the pig, it will die and the game is over.



4. Hello World to OpenAI

Set up to run the OPENAI using Window Powershell

Download and Install Python 3.8.0



```
Windows PowerShell
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

try the new cross-platform PowerShell https://aka.ms/powershell

PS C:\Users\vytha> cd openal-quickstart-python-master
PS C:\Users\vytha\openal-quickstart-python-master> cd openal-quickstart-python-master
PS C:\Users\vytha\openal-quickstart-python-master\openal-quickstart-python-master> cp .env.example .env
PS C:\Users\vytha\openal-quickstart-python-master\openal-quickstart-python-master> python -m venv venv
PS C:\Users\vytha\openal-quickstart-python-master\openal-quickstart-python-master> .\venv\Scripts\activate.bat
PS C:\Users\vytha\openal-quickstart-python-master\openal-quickstart-python-master> pip install -r requirements.txt
Collecting autodep@1.6.0 (from -r requirements.txt (line 1))
  Downloading https://files.pythonhosted.org/packages/39/3a/cd60ecce0d9737efcf06a074ae280a5d0e904d697f59b414bf8ab5c477/autodep-1.6.0-py2.py3-none-any.whl (45kB)
    | 51kB 825kB/s
Collecting certifi==2021.10.8 (from -r requirements.txt (line 2))
  Downloading https://files.pythonhosted.org/packages/27/45/946ce0276aabb873146011e665728b60884cd8fe70dde973c640e45b775/certifi-2021.10.8-py2.py3-none-any.whl (149kB)
    | 153kB 2.2MB/s
Collecting charset-normalizer==2.0.7 (from -r requirements.txt (line 3))
  Downloading https://files.pythonhosted.org/packages/de/c8/820b1546c68efcbec1b10dd925fbd84a0dda7438bc18db0ef1fa567733/charset-normalizer-2.0.7-py3-none-any.whl
Collecting click==8.0.3 (from -r requirements.txt (line 4))
  Downloading https://files.pythonhosted.org/packages/48/58/c8a6a8e62cc7539fee1092c45d0b6ba684122697d7ce7d53f64f98a129/click-8.0.3-py3-none-any.whl (97kB)
    | 102kB 3.2MB/s
Collecting et-xmlfile==1.1.0 (from -r requirements.txt (line 5))
  Downloading https://files.pythonhosted.org/packages/96/c2/3dd434b0100730014f1b96fd28604dc3bc700663467e01ec2ac95b65f/et_xmlfile-1.1.0-py3-none-any.whl
Collecting Flask==2.0.2 (from -r requirements.txt (line 6))
  Downloading https://files.pythonhosted.org/packages/af/b6/b4f4dcbed01ee20f9cf81dcf9d3cdcc2f874b996f186f1c0b8984a59c04/Flask-2.0.2-py3-none-any.whl (95kB)
    | 102kB 6.8MB/s
Collecting idna==3.3 (from -r requirements.txt (line 7))
  Downloading https://files.pythonhosted.org/packages/64/a2/d918dc22354d8958fe113e1a3630137e0fc8b44859ade3063982eacd2a4/idna-3.3-py3-none-any.whl (61kB)
    | 61kB ...
Collecting itsdangerous==2.0.1 (from -r requirements.txt (line 8))
  Downloading https://files.pythonhosted.org/packages/9c/96/26f935afba0c6140216da5add22a0c465b99d0f112b68a4ca26441019/itsdangerous-2.0.1-py3-none-any.whl
Collecting Jinja2==3.0.2 (from -r requirements.txt (line 9))
  Downloading https://files.pythonhosted.org/packages/94/42/d8bca8e99789bc35df9b03acaa8b518720d6e00163745bc2bf2ead842/Jinja2-3.0.2-py3-none-any.whl (133kB)
    | 143kB 3.3MB/s
Collecting MarkupSafe==2.0.1 (from -r requirements.txt (line 10))
  Downloading https://files.pythonhosted.org/packages/9c/96/26f935afba0c6140216da5add22a0c465b99d0f112b68a4ca26441019/MarkupSafe-2.0.1-cp38-cp38-win_amd64.whl
Collecting numpy==1.21.3 (from -r requirements.txt (line 11))
  Downloading https://files.pythonhosted.org/packages/58/98/130f4c2ad489a4283aeac67c9b16a8e382997a14530c65c187eb4ad739/numpy-1.21.3-cp38-cp38-win_amd64.whl (14.0MB)
    | 14.0MB 6.0MB/s
Collecting openal==0.19.0 (from -r requirements.txt (line 12))
  Downloading https://files.pythonhosted.org/packages/b1/67/87be1902ecc3bb2863263f20e5740559ab4669d84146376121bd5213a4a9/openal-0.19.0.tar.gz (42kB)
    | 51kB ...
Installing build dependencies ... done
Getting requirements to build wheel ... done
Preparing wheel metadata ... done
Collecting openpyxl==3.0.9 (from -r requirements.txt (line 13))
  Downloading https://files.pythonhosted.org/packages/1c/a6/8ce4d2ef2c29be3235c08b00e0b81e29d38ebc47d82b17af681bf662b7a/openpyxl-3.0.9-py2.py3-none-any.whl (242kB)
    | 245kB 3.3MB/s
Collecting pandas==1.3.4 (from -r requirements.txt (line 14))
  Downloading https://files.pythonhosted.org/packages/1c/a6/8ce4d2ef2c29be3235c08b00e0b81e29d38ebc47d82b17af681bf662b7a/pandas-1.3.4-cp38-cp38-win_amd64.whl (10.2MB)
    | 10.2MB 2.2MB/s
Collecting pandas-stubs==1.2.0.35 (from -r requirements.txt (line 15))
  Downloading https://files.pythonhosted.org/packages/26/23/b01dc717e02147615d4ca4ed682396c5bed0265061c5a27b1f907ebac4/pandas_stubs-1.2.0.35-py3-none-any.whl (159kB)
    | 163kB 3.3MB/s
Collecting pycodestyle==2.8.0 (from -r requirements.txt (line 16))
  Downloading https://files.pythonhosted.org/packages/15/94/bc43a2efb70615e38acde2b6624cae89ec86fa718ff5676c5179a7714/pycodestyle-2.8.0-py2.py3-none-any.whl (42kB)
    | 51kB 3.2MB/s
Collecting python-dateutil==2.8.2 (from -r requirements.txt (line 17))
  Downloading https://files.pythonhosted.org/packages/36/7a/87837f39d0206e723bb9b62bbb2570835c7f6128853c78955f7342a56d/python_dateutil-2.8.2-py2.py3-none-any.whl (247kB)
    | 256kB 3.3MB/s
Collecting python-dotenv==0.19.2 (from -r requirements.txt (line 18))
  Downloading https://files.pythonhosted.org/packages/b0/f1/0317f4b2c5284075a2154fe95539b430a4ecbcb86f80fcb2645803edd9/python_dotenv-0.19.2-py2.py3-none-any.whl
Collecting pytz==2021.3 (from -r requirements.txt (line 19))
```

How to use

Enter the animal and it will generate four different names



Welcomes to my rabbit house

Enter an animal

Generate names

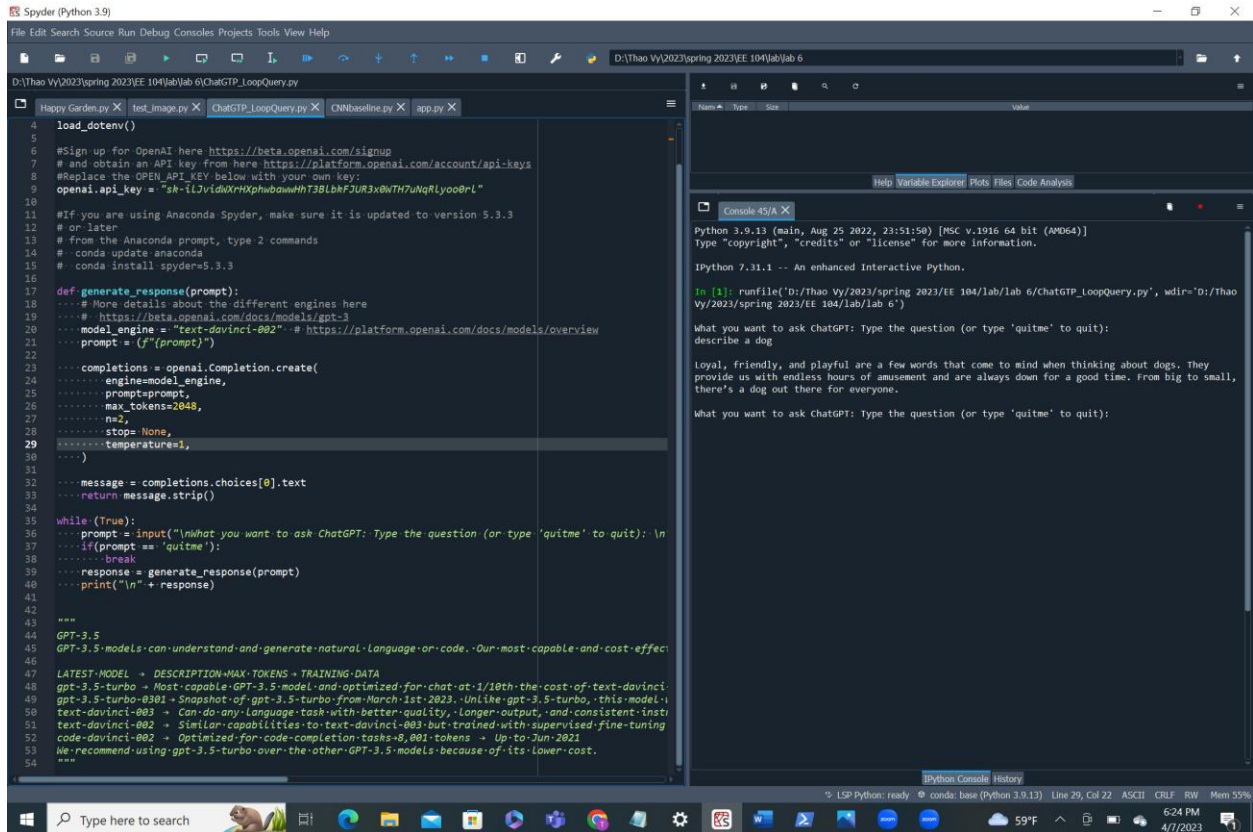
Paws of Justice, Captain Purrfect, The Amazing Feline, Super

5. Hello World to ChatGPT

Set up the API key to run the Chat GPT

Run the python code

Then ask the question or enter quitme to quit



The screenshot shows the Spyder Python IDE interface. The main editor displays a Python script named `ChatGTP_LoopQuery.py`. The script includes comments for setting up the OpenAI API key and instructions for using Anaconda Spyder. It defines a `generate_response(prompt)` function that uses the OpenAI API to generate text based on a prompt. The script also includes a `while` loop that prompts the user to ask a question or type 'quitme' to quit. The console output shows the script running successfully, displaying the OpenAI API key and the generated response for the prompt 'describe a dog'.

```
4 load_dotenv()
5
6 #Sign up for OpenAI here https://beta.openai.com/signup
7 # and obtain an API key from here https://platform.openai.com/account/api-keys
8 #Replace the OPEN_API_KEY below with your own keys
9 openai.api_key = "sk-ilJvldNKRHXphubawHhT3BlbF3UR3x0WTH7uNqRLyoo0PL"
10
11 #If you are using Anaconda Spyder, make sure it is updated to version 5.3.3
12 # or later
13 # From the Anaconda prompt, type 2 commands
14 # conda update anaconda
15 # conda install spyder=5.3.3
16
17 def generate_response(prompt):
18     """More details about the different engines here
19     """
20     # https://beta.openai.com/docs/models/gpt-3
21     model_engine = "text-davinci-002" # https://platform.openai.com/docs/models/overview
22     prompt = f"{prompt}"
23
24     completions = openai.Completion.create(
25         engine=model_engine,
26         prompt=prompt,
27         max_tokens=2048,
28         stop=None,
29         temperature=1,
30     )
31     message = completions.choices[0].text
32     return message.strip()
33
34 while (True):
35     prompt = input("\nWhat you want to ask ChatGPT: Type the question (or type 'quitme' to quit): \n")
36     if (prompt == 'quitme'):
37         break
38     response = generate_response(prompt)
39     print("\n" + response)
40
41
42
43
44 GPT-3.5
45 GPT-3.5-models-can-understand-and-generate-natural-language-or-code.-Our-most-capable-and-cost-effective
46
47 LATEST-MODEL -> DESCRIPTION-MAX-TOKENS + TRAINING-DATA
48 gpt-3.5-turbo -> Most-capable-GPT-3.5-model-and-optimized-for-chat-at-1/10th-the-cost-of-text-davinci
49 gpt-3.5-turbo-0301 -> Snapshot-of-gpt-3.5-turbo-from-March-1st-2023.-Unlike-gpt-3.5-turbo, this model i
50 text-davinci-003 -> Can-do-any-language-task-with-better-quality,-longer-output,-and-consistent-instr
51 text-davinci-002 -> Similar-capabilities-to-text-davinci-003-but-trained-with-supervised-fine-tuning
52 code-davinci-002 -> Optimized-for-code-completion-tasks-8,001-tokens -> Up-to-June-2021
53 We-recommend-using-gpt-3.5-turbo-over-the-other-GPT-3.5-models-because-of-its-lower-cost.
54
55 """
```

Console Output:

```
Python 3.9.13 (main, Aug 25 2022, 23:51:50) [MSC v.1916 64 bit (AMD64)]
Type "copyright", "credits" or "license()" for more information.

IPython 7.31.1 -- An enhanced Interactive Python.

In [1]: runfile('D:/Thao Vy/2023/spring 2023/EE 104/lab/lab 6/chatGTP_LoopQuery.py', wdir='D:/Thao Vy/2023/spring 2023/EE 104/lab/lab 6')

What you want to ask ChatGPT: Type the question (or type 'quitme' to quit):
describe a dog

Loyal, friendly, and playful are a few words that come to mind when thinking about dogs. They
provide us with endless hours of amusement and are always down for a good time. From big to small,
there's a dog out there for everyone.

What you want to ask ChatGPT: Type the question (or type 'quitme' to quit):
```