课程专业实践报告

学号					
实验题目	实验三 matplotlib 模块使用				

一．程序代码

(1)问题 1

```
import numpy as np
import matplotlib.pyplot as plt

x = np.arange(0, 100)
y = x * 2
z = x ** 2

fig = plt.figure()
ax = fig.add_axes([0, 0, 1, 1])
plt.plot(x, x)
ax.set_title('title')
ax.set_xlabel('x')
ax.set_ylabel('y')

plt.show()
```

(2)问题 2

```
import numpy as np
import matplotlib.pyplot as plt

x = np.linspace(0, 2, 100)
y = x ** 2
z = x ** 3
plt.xlabel("x label")
plt.ylabel("y label")
plt.plot(x, x)
plt.plot(x, y)
plt.plot(x, z)
plt.title('Simple Plot')
plt.legend(['linear', 'quadratic', 'cubic'])
plt.show()
```

(3)问题 3

```
import numpy as np



def f(t):
```

```
        return np.exp(-t) * np.cos(2 * np.pi * t)


t1 = np.arange(0.0, 5.0, 0.1)
t2 = np.arange(0.0, 5.0, 0.02)
x = f(t1)
y = np.cos(2 * np.pi * t2)

import matplotlib.pyplot as plt
import numpy as np

# plot 1:

plt.subplot(2, 1, 1)
plt.plot(t1, x ,color = 'k')
plt.scatter(t1, x , color = 'b')

# plot 2:

plt.subplot(2, 1, 2)
plt.plot(t2, y, ls = '--',color = 'r')

plt.show()
```

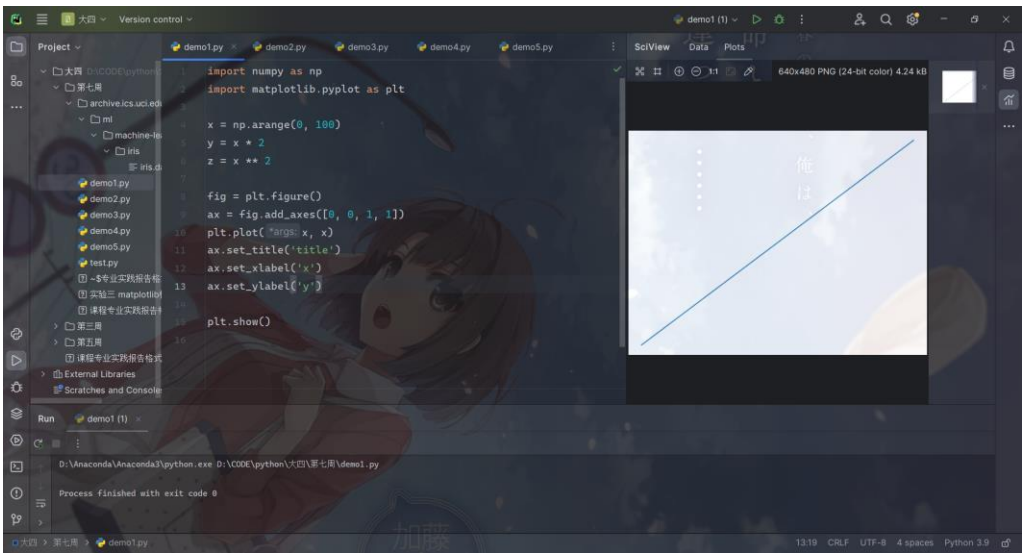
(4)问题 4

```
from matplotlib.font_manager import FontProperties
import matplotlib.pyplot as plt

font = FontProperties(fname=r"C:\windows\Fonts\MISTRAL.ttf", size=14)
x1 = [1, 3, 5, 7, 9]
y1 = [5, 4, 8, 12, 7]
x2 = [2, 4, 6, 8, 10]
y2 = [4, 6, 8, 13, 15]

plt.bar(x1, y1)
plt.bar(x2, y2, color='orange')
plt.xlabel('number')
plt.ylabel('value')
plt.title('graph')
plt.legend(['graph 1', 'graph 2'])

plt.show()
```

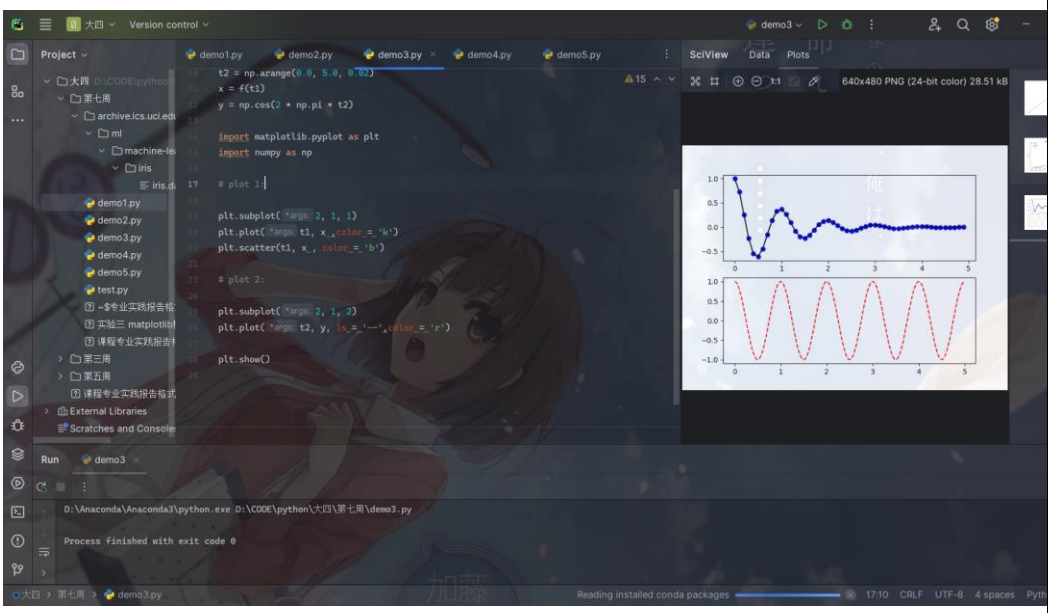
(5)问题 5

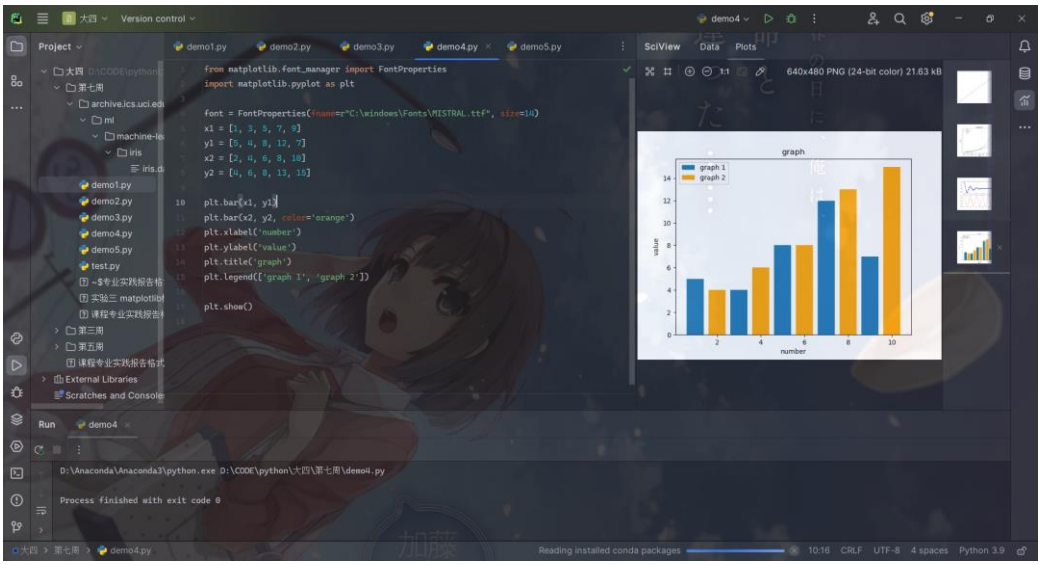
```
import numpy as np
import matplotlib.pyplot as plt

url = 'https://archive.ics.uci.edu/ml/machine-learning-databases/iris/iris.data'
iris = np.genfromtxt(url, delimiter=',', dtype=None, encoding='utf-8')

length1 = np.array([row[2] for row in iris[0:50]])
width1 = np.array([row[3] for row in iris[0:50]])
plt.scatter(length1, width1, marker='s', color='b')

length2 = np.array([row[2] for row in iris[50:100]])
width2 = np.array([row[3] for row in iris[50:100]])
plt.scatter(length2, width2, marker='x', color='k')

length3 = np.array([row[2] for row in iris[100:150]])
width3 = np.array([row[3] for row in iris[100:150]])
plt.scatter(length3, width3, color='r')

plt.title('Iris Data Set')
plt.xlabel('petal length (cm)')
plt.ylabel('petal width (cm)')
plt.grid(True)
plt.legend(['setosa', 'versicolor', 'virginica'])

plt.show()
```

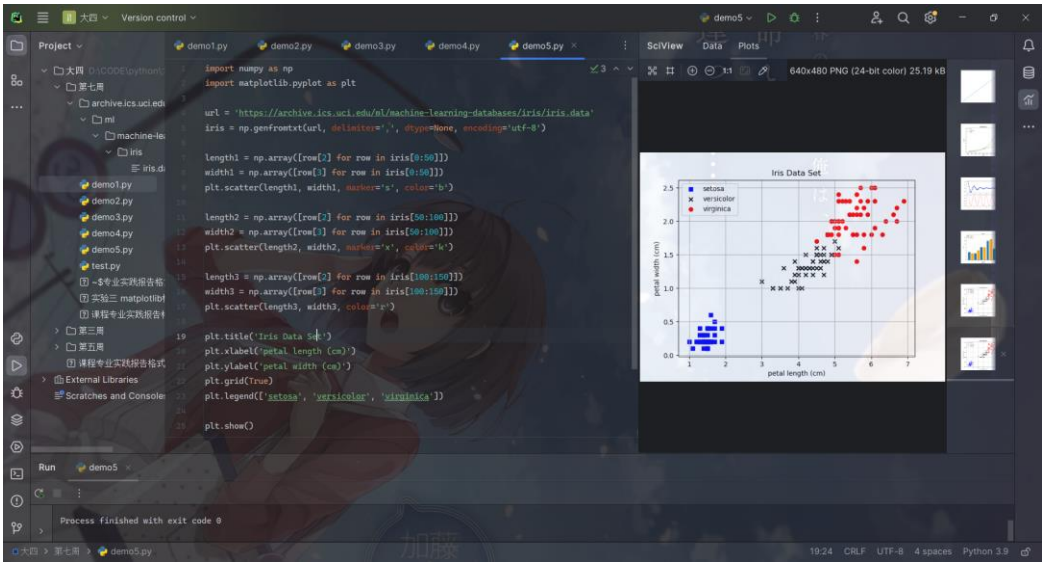
二．运行结果




demo2
demo1.py
demo2.py
demo3.py
demo4.py
demo5.py
SciView
Data
Plots
640x480 PNG (24-bit color) 25.55 kB
Simple Plot
linear
quadratic
cubic
x label
y label
Run
demo2
D:\Anaconda\Anaconda3\python.exe D:\CODE\python\大四\第七周\demo2.py
Process finished with exit code 0


demo3
demo1.py
demo2.py
demo3.py
demo4.py
demo5.py
SciView
Data
Plots
640x480 PNG (24-bit color) 28.51 kB
Run
demo3
D:\Anaconda\Anaconda3\python.exe D:\CODE\python\大四\第七周\demo3.py
Process finished with exit code 0


demo4
demo1.py
demo2.py
demo3.py
demo4.py
demo5.py
SciView
Data
Plots
640x480 PNG (24-bit color) 21.63 kB
graph
graph 1
graph 2
value
number
Run
demo4
D:\Anaconda\Anaconda3\python.exe D:\CODE\python\大四\第七周\demo4.py
Process finished with exit code 0


Version control
demo5
Project
demo1.py
demo2.py
demo3.py
demo4.py
demo5.py
SciView
Data
Plots
640x480 PNG (24-bit color) 25.19 kB
import numpy as np
import matplotlib.pyplot as plt
url = 'https://archive.ics.uci.edu/ml/machine-learning-databases/iris/iris.data'
iris = np.genfromtxt(url, delimiter=',', dtype=None, encoding='utf-8')
length1 = np.array([row[2] for row in iris[0:50]])
width1 = np.array([row[3] for row in iris[0:50]])
plt.scatter(length1, width1, marker='s', color='b')
length2 = np.array([row[2] for row in iris[50:100]])
width2 = np.array([row[3] for row in iris[50:100]])
plt.scatter(length2, width2, marker='x', color='k')
length3 = np.array([row[2] for row in iris[100:150]])
width3 = np.array([row[3] for row in iris[100:150]])
plt.scatter(length3, width3, color='r')
plt.title('Iris Data Set')
plt.xlabel('petal length (cm)')
plt.ylabel('petal width (cm)')
plt.grid(True)
plt.legend(['setosa', 'versicolor', 'virginica'])
plt.show()
Iris Data Set
setosa
versicolor
virginica
petal width (cm)
petal length (cm)
Run
demo5
Process finished with exit code 0
19:24
CRLF
UTF-8
4 spaces
Python 3.9