**Python编程基础**

**1. Python基本数据类型**

print(type(True))

print(type(1))

print(type('hellow world'))

print(type([18,28,15]))

print(type({'小张': 80, '小李':85, '小周': 78}))

**2. 变量与赋值**

1. a = 1
2. b = 4
3. c = [1,2,3]
4. print(a, b)
5. print(c[1])

**3. 条件判断**

### 判断成绩优（>=90），良（>=70,<90）,差（<70）

score = 67

if score >= 90:

  print('成绩为优秀')

elif score >= 70 and score<90:

  print('成绩为良好')

else :

  print('成绩为差')

**4. 循环**

### 获得成绩为优秀的同学个数

scores=[70,76,84,83,94,91,93,79,81,90]

num = 0

for score in scores:

  # print(score)

  if score >= 90:

    num=num+1

print('获得成绩为优秀的同学个数为：', num)

**5. 函数**

### 自动统计出超出一给定分数的同学人数。

scores=[70,76,84,83,94,91,93,79,81,90]

def num\_higher(s, s\_high=90):

  num = 0

  for score in s:

    # print(score)

    if score >= s\_high:

      num=num+1

  return num

num = num\_higher(s=scores, s\_high=80)

print('超过给定分数的同学人数为：', num)

**6. 模块**

# import os

# os.chdir('D:\open-source-gis-course/第3章-开源GIS软件开发环境-6课时')

from python\_module import num\_higher\_m

scores=[70,76,84,83,94,91,93,79,81,90]

num = num\_higher\_m(ss=scores, s=80)

print('超过给定分数的同学人数为：', num)

**7. 软件包调用**

import numpy as np

array = np.array([1,2,3,4,5])

print(array)

arr\_mean = np.mean(array)

print(arr\_mean)

**Matplotlib基础**

import matplotlib.pyplot as plt

import numpy as np

**1. matplotlib绘图基础**

fig = plt.figure(figsize=(6,4))

ax = fig.add\_axes([0, 0, 1, 1])

ax.set\_title('title', size=20)

ax.set\_xlabel('xlabel', size=20)

ax.tick\_params(axis='x', labelsize=14)

fig, axes = plt.subplots(1, 2, figsize=(10,4))

**2. 绘制线性图**

### 序列数据可视化

data = [1,2,3,4]

fig, ax = plt.subplots(1,2, figsize=(10,5))

ax[0].plot(data, marker='.', color='red', markersize=10)

**3. 绘制散点图**

### 散点数据可视化

data\_x = [1,2,3,4]

data\_y = [3,2,1,4]

# data\_z = [100,70,260,200]  ## set: s=data\_z

fig, ax = plt.subplots(1,1, figsize=(5,5))

ax.scatter(data\_x, data\_y, s=60, marker='\*', color='green')

**4. 绘制柱状图**

### 柱状图

fig, ax = plt.subplots(1,1, figsize=(5,4))

data\_scores = [87,92,79,82]

data\_student = ['zhang1', 'zhang2', 'zhang3', 'zhang4']

ax.bar(data\_student, data\_scores, width=0.4, color='red')

**5. 图像数据可视化**

### 图像数据可视化

arr\_2d = np.random.randn(100,100)

arr\_2d.shape

fig, ax = plt.subplots(1,1, figsize=(5,5))

ax.imshow(arr\_2d, cmap='grey')