

New Media Data Analytics and Application Lecture 4: Advanced Python Programming

Ting Wang



- File and Stream I/O
- Connect to Database
- Web Programming







input text from web or documents and output it File and Stream I/O

Stream 流

a sequence of data elements made available over time.



Eg: The standard streams for input, output, and error.





Files and Stream





Read Files (Input)

with open('FILE_PATH', 'r/rb') as VARIABLE_NAME
VARIABLE_NAME.read()

Write Files (Output)

with open('FILE_PATH', 'w/wb') as VARIABLE_NAME
VARIABLE_NAME.write('TEXT')

Absolute and Relative Paths 绝对和相对路径



EXAMPLE 1: Write and Read Files



Example: Document Write-Save-Read

```
import datetime
with open('test.txt', 'w') as f:
    f.write('今天是 ')
    f.write(datetime.datetime.now().strftime('%Y-%m-%d'))
with open('test.txt', 'r') as f:
    s = f.read()
```

```
print('open for read...')
print(s)
```





Example: Webpage Crawling

import urllib.request
response = urllib.request.urlopen('http://www.shisu.edu.cn/about/introducing-sisu')
HTMLText = response.read()

with open('Files/shisu.html', 'wb') as f:
 f.write(HTMLText)





connect python with SQLite, MySQL and SQL Server Connect to Database

- How to use database in programming?
 - Steps:
 - 1. Connection Open
 - 2. Cursor Creating
 - 3. SQL Execution
 - 4. Cursor Moving
 - 5. Connection Close





SQLite

- SQLite is a high-reliability, embedded, zeroconfiguration, public-domain, SQL database engine.
- SQLite is integrated in python and can be used directly.
- SQLite is a ".db" file.
- SQLite can be used with Android/iOS.
- http://www.sqlite.org/



SQLite Studio

a visual tool for SQLite

http://sqlitestudio.pl/



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	2 2 Albert Einstein uisu 3 3 Marie Curie shina	
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	I2233141 Ouery finished in 0.346 second(s). Rows affected: 3	







import sqlite3
#read from SQL script
with open('create.sql', 'r') as f1:
 s1 = f1.read()
连接到SQLite数据库
若文件不存在,则自动创建
#1.Connection Open
conn=sqlite3.connect('Ex2SQLiteExample.db')
#2.Cursor Creating:
cursor = conn.cursor()

#3.SQL Execution #执行一条SQL语句,创建表: cursor.execute(s1) #继续执行SQL语句,循环插入记录: with open('insert.sql', 'r') as f2: **#4.Cursor Moving** #体验游标 for line in f2.readlines(): #执行,游标移至当前位置 cursor.execute(line) #提交事务: conn.commit() **#5.Connection Close** #关闭Cursor: cursor.close() #关闭Connection: conn.close()



Result review by SQLite Studio

	CUSTOMER_ID	CUSTOMER_NAME	CUSTOMER_PWD	
1	1	Thomas Edison	sisu	
2	2	Albert Einstein	sisu	
3	3	Marie Curie	shisu	

a brief introduction:

How to install and use SQLite Studio?

- Just click it! 🖉 SQLiteStudio.exe



MySQL

an open-source relational database management system (RDBMS)

LAMP

- Linux
- Apache
- Perl+PHP+Python
- *MySQL*





MySQL Installation

لاکر MySQL. Installer Adding Community	License Agreement	
	To proceed you must accept the Oracle Software License Terms.	
icense Agreement	GNU GENERAL PUBLIC LICENSE Version 2, June 1991	* III
hoosing a Setup Type	Copyright (C) 1989, 1991 Free Software Foundation, Inc., 51 Franklin Street, Fifth Floor, Boston, MA 02110-1301 USA	
stallation	Everyone is permitted to copy and distribute verbatim copies of this license document, but changing it is not allowed.	
istallation Complete	Preamble ====== The licenses for most software are designed to take away your freedom to share and change it. By contrast, the GNU General Public License is intended to guarantee your freedom to share and change free softwareto make sure the software is free for all its users. This General Public License applies to most of the Free Software Foundation's software and to any other program whose authors commit to using it. (Some other Free Software Foundation software is covered by	
	the GNU Library General Public License instead.) You can apply it to your programs, too. When we speak of free software, we are referring to freedom, not price. Our General Public Licenses are designed to make sure that you have the freedom to distribute copies of free software (and charge for this	
	I accept the license terms	



< Back

Next >

Cancel

MySQL Installer		
MySQL. Installe Adding Community	Choosing a Setup Type Please select the Setup Type that suits y	our use case.
License Agreement	O Developer Default	Setup Type Description
Choosing a Setup Type	Installs all products needed for MySQL development purposes.	Installs all of the products available in this catalog including MySQL Server, MySQL Workbench, MySQL Connectors, documentation, samples and
Check Requirements	Server only	examples and much more.
Installation	Installs only the MySQL Server product.	
Product Configuration	Client only	
Installation Complete	Installs only the MySQL Client products, without a server.	
	Full	
	Installs all included MySQL products and features.	
	Custom	
	Manually select the products that should be installed on the system.	



MySQL Installer A Requirement: MySQL: Installer **Check Requirements** Python 3.5 is **NOT** officially Adding Community The following products have failing requirements. The installer will attempt to resolve some of this automatically. Requirements marked as manual cannot be resolved automatically. Supported by MySQL Click on those items to try and resolve them manually. License Agreement For Product Requirement Status Choosing a Setup Type Connector/Python (3.4) 2.1.3 Python 3.4 is not installed Manual **Check Requirements** Just ignore it! Product Configuration Installation Complete Confirm One or more product requirements have not been satisified. Those products with missing requirements will be not installed/upgraded. Do you wish to continue? 是(Y) 否(N) < Back Next > Cancel

Connector/Python 2.1.3			
Select Platform: Microsoft Windows		Looking for previous GA versions?	
Windows (x86, 32-bit), MSI Installer Python 2.7 (mysql-connector-python-2.1.3-py2.7-win32.msi)	2.1.3	1.4M Download MD5: fb91bfae05105e35eb69bef38db3b53a Signature	
Windows (x86, 32-bit), MSI Installer Python 3.3 (mysql-connector-python-2.1.3-py3.3-win32.msi)	2.1.3	1.4M Download MD5: 51195cfal:c225aa6180ae1c3d56860a7 Signature	
Windows (x86, 32-bit), MSI Installer Python 3.4 (mysql-connector-python-2.1.3-py3.4-win32.msi)	2.1.3	1.4M Download MD5: 0823bb56b0b3643670 \$\$284386244484f Signature	2 5!!
Windows (x86, 64-bit), MSI Installer Python 2.7 (mysql-connector-python-2.1.3-py2.7-winx64.msi)	2.1.3	1.5M Download	o Python 5.5.4
Windows (x86, 64-bit), MSI Installer Python 3.3 (mysql-connector-python-2.1.3-py3.3-winx64.msi)	2.1.3	1.5M Download MD5: e6 af50bb969ee5f9dbdfdf832ee77b3d Signature	
Windows (x86, 64-bit), MSI Installer Python 3.4 (mysql-connector-python-2.1.3-py3.4-winx64.msi)	2.1.3	1.5M Download MD5: cdf45c4055261d8fa333959fb40b312e Signature	

http://dev.mysql.com/downloads/connector/python/



Product MySQL Installer MySQL. Installer Product Configuration **Configuration** Adding Community We'll now walk through a configuration wizard for each of the following products. You can cancel at any point if you wish to leave this wizard without configuring all the products. License Agreement Product Status Choosing a Setup Type MySQL Server 5.7.15 Ready to Configure Installation Samples and Examples 5.7.15 Ready to Configure Product Configuration Installation Complete 111 Next > Cancel



Notes

<u>Cancel</u>

Installation







Show Advanced Options

MySQL Installer	
MySQL. Installer MySQL Server 5.7.15	Type and Networking Server Configuration Type Choose the correct server configuration type for this MySQL Server installation. This setting will define how much system resources are assigned to the MySQL Server instance.
Type and Networking	Config Type: Development Machine -
Accounts and Roles	Connectivity
Windows Service	Use the following controls to select how you would like to connect to this server.
Plugins and Extensions	Open Firewall port for network access
Advanced Options	Named Pipe Pipe Name: MYSQL
Apply Server Configuration	Shared Memory Memory Name: MYSQL
	Advanced Configuration
	Select the checkbox below to get additional configuration page where you can set advanced options for this server instance. Show Advanced Options
	<u>N</u> ext > <u>C</u> ancel



Account and Roles





MySQL Installer	
MySQL. Installer MySQL Server 5.7.15	Windows Service Configure MySQL Server as a Windows Service
Type and Networking Accounts and Roles	Windows Service Details Please specify a Windows Service name to be used for this MySQL Server instance. A unique name is required for each instance. Windows Service Name: MySQL57
Windows Service	Start the MySQL Server at System Startup
Plugins and Extensions	
Advanced Options Apply Server Configuration	 Run Windows Service as The MySQL Server needs to run under a given user account. Based on the security requirements of your system you need to pick one of the options below. Standard System Account Recommended for most scenarios. Custom User An existing user account can be selected for advanced scenarios.
	< <u>B</u> ack <u>N</u> ext > <u>C</u> ancel



New MySQL Function for NoSQL





Logs	MySQL Installer	
0	MySQL. Installer MySQL Server 5.7.15	Advanced Options Logging Options Please select the logs you want to activate for this server in addition to the Error Log. On production machines it can be beneficial to separate the log files from the data.
	Type and Networking	Error Log: TING-PC.err
	Accounts and Roles	🖉 General Log
	Windows Service	The general query log is a general record of what the MySQL Server is doing. It should only be used to track down issues.
	Plugins and Extensions	File Path: TING-PC.log
	Advanced Options	✓ Slow Query Log
	Apply Server Configuration	The slow query log consists of SQL statements that took more than the given value of seconds to execute. It is recommended to turn this log on.
		File Path: TING-PC-slow.log Seconds: 10
		🖉 Bin Log
		The binary log contains all database events and is used for replication and data recovery operations. It has a performance impact on the server. Only a filename base should be given as the server will append an approriate extension
		File Path: TING-PC-bin
		Server Id: 1
1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1		< <u>B</u> ack <u>N</u> ext > <u>C</u> ancel

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MySQL Server Server Configuration

NySQL Installer	CALLON - F gross Las-	
MySQL. Installer MySQL Server 5.7.15	Apply Server Configuration	
	Press [Execute] to apply the changes	
	Configuration Steps Log	
Type and Networking	Stopping Server [if necessary]	
Accounts and Roles	 Writing configuration file 	
Windows Service	 Updating firewall 	
Plugins and Extensions	 Adjusting Windows service [if necessary] 	
Advanced Options	 Initializing Database [if necessary] 	
	 Starting Server 	
Apply Server Configuration	 Applying security settings 	
	O Creating user accounts	
	O Updating Start Menu Link	
	 Updating Firewall for MySQL Document Data Feature Set 	
	< <u>B</u> ack E <u>x</u> ecute	<u>C</u> ancel



Sometimes, maybe...if you are using Wifi



х 🔐 Windows 安全警报 Windows 防火墙已经阻止此程序的部分功能 Windows 防火墙已阻止所有公用网络和专用网络上的 mysgld.exe 的某些功能。 名称(M): mysqld.exe 发布者(P): 未知 路径(H): C:\program files\mysql\mysql server 5.7\bin \mvsald.exe 允许 mysgld exe 在这些网络上诵信: ☑ 专用网络,例如家庭或工作网络 (R) 公用网络,例如机场和咖啡店中的网络(不推荐,由于公用网络通常安全性很小或者根本不安全)(0) 允许程序通过防火墙有何风险? 允许访问(A) 取消



MySQL Server Apply Server Configuration

Type and Networking Accounts and Roles	
Accounts and Roles	
Windows Service	
Plugins and Extensions	
Advanced Options	
Apply Server Configuration	

MySQL Installer

Apply Server Configuration

The configuration operation has stopped.

Configuration Steps Log

- Stopping Server [if necessary]
- Updating firewall
- ✓ Initializing Database [if necessary]
- Starting Server
- Applying security settings
- Updating Start Menu Link
- ✓ Updating Firewall for MySQL Document Data Feature Set

Configuration for MySQL Server 5.7.15 has succeeded. Please click Finish to continue.



<u>F</u>inish

Prepare to install Samples – Check!

MySQL. Installer Samples and Examples	Connect To Serve	er		
Connect To Sonier	Here are the compatible s	ervers installed. If more than	one, please select one.	
	Server	Architecture	Status	
	Now give us the credentia make sure they work.	ls we should use (needs to ha	ve root privileges). Click	c check to
	Now give us the credentia make sure they work. User: root	Is we should use (needs to ha	ve root privileges). Click als provided in Server co	c check to



Samples Apply Server Configuration

MySQL Installer		x
MySQL. Installer Samples and Examples	Apply Server Configuration	
Connect To Server	Checking if there are any features installed that need configuration.	
Apply Server Configuration	O Starting Server.	
	 Getting Connection information (Provide credentials if it is needed). 	
	O Running Scripts.	
	O Stopping Server.	
	< <u>B</u> ack Execute Cance	:



Finish

Server Configuration

MySQL Installer	
MySQL. Installer Samples and Examples	Apply Server
	The configuration o
	Configuration Step
Connect To Server	♂ Checking
Apply Server Configuration	

The config	juration operation has stopped.
Configur	ation Steps Log
${\boldsymbol{ \heartsuit}}$	Checking if there are any features installed that need configuration.
۷	Starting Server.
۷	Getting Connection information (Provide credentials if it is needed).
${\boldsymbol{\triangleleft}}$	Running Scripts.
۷	Stopping Server.

Configuration for Samples and Examples 5.7.15 has succeeded. Please click Finish to continue.



Next	MySQL Installer	0.11100. 9 9 2			
	MySQL. Installer Adding Community	Product Configuration	ard for each of the following products		
	Choosing a Setup Type	You can cancel at any point if you wish to leave this wizard without configuring all the products.			
	Installation	Product	Status		
	Product Configuration	MySQL Server 5.7.15 Samples and Examples 5.7.15	Configuration Complete. Configuration Complete.		
	Installation Complete				
		•	4		
			Next > Cancel		



Complete





Test	MySQL 5.7 Command Line Client
- Successful?	Enter password: ***** Welcome to the MySQL monitor. Commands end with ; or \g. Your MySQL connection id is 9
- Test it!	Copyright (c) 2000, 2016, Oracle and/or its affiliates. All rights reserved.
– <i>Iest u</i> :	Oracle is a registered trademark of Oracle Corporation and/or its affiliates. Other names may be trademarks of their respective owners.
	Type 'help;' or '\h' for help. Type '\c' to clear the current input statement. mysql> show databases;
	++ Database ++
	¦ information_schema mysql performance_schema ! sakila !
	i sustituti i i sys i i world i tt
F·洛 (1-1-1-1) 法上 脚	6 rows in set (0.00 sec) mysql>



Install a third-party module for the connection between Python and MySQL: Preparation

Python setuptools: A Preparation

If you have **NO** Python *setuptools*, Install it in the first place!

If you have **already installed** Python *setuptools*, ignore this page and turn to the next!

Step1: Download the file from: https://bootstrap.pypa.io/ez_setup.py

Step2: Install ez_setup.py with the command in Windows CMD: python ez_setup.py



pymysql, a third-party module for the connection between Python and MySQL

Step1:Download pymysql, https://github.com/PyMySQL/PyMySQL

Step2:Install pymysql with the command in Windows CMD: python setup.py install



Tips

Do NOT forget to restart your IDE after you install some new third-party modules.





Start MySQL Workbench



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Code

import pymysql

```
# 连接到MySQL数据库
#1.Connection Open
conn = pymysql.connect(user='root',
password='123456', database='login')
#2.Cursor Creating:
cursor = conn.cursor()
```

#3.SQL Execution # 执行SQL语句,循环插入记录:

with open('insertMySQL.sql', 'r') as f2: #4.Cursor Moving #体验游标 for line in f2.readlines(): #执行,游标移至当前位置 cursor.execute(line) #提交事务: conn.commit() **#5.Connection Close** #关闭Cursor: cursor.close() #关闭Connection: conn.close()





Microsoft SQL Server

a relational database management system developed by Microsoft

Microsoft SQL Server Express is a version of Microsoft SQL Server relational database management system that is free to download, distribute and use.





pymssql, a third-party module for connecting Python and Microsoft SQL Server

Step1:Download pymssql, https://pypi.python.org/pypi/pymssql

pymssql-2.1.3-cp35-cp35m-win32.whl (md5) pymssql-2.1.3-cp35-cp35m-win_amd64.whl (md5) pymssql-2.1.3.tar.gz (md5)

Step2:Install pymssql with the command in Windows CMD: pip install pymssql-2.1.3-cp35-cp35m-win_amd64.whl

https://pypi.python.org/pypi/pip









import pymssql

```
#连接到MSSQL数据库
#1.Connection Open
conn = pymssql.connect(user='sa',
password='123456', database='login')
#2.Cursor Creating:
cursor = conn.cursor()
#3.SQL Execution
#执行SQL语句,循环插入记录:
with open('createMSSQL.sql', 'r') as f1:
 s1 = f1.read()
 #执行一条SQL语句,创建表:
cursor.execute(s1)
```

with open('insertMSSQL.sql', 'r') as f2: **#4.Cursor Moving** #体验游标 for line in f2.readlines(): #执行,游标移至当前位置 cursor.execute(line) #提交事务: conn.commit() **#5.Connection Close** #关闭Cursor: cursor.close() #关闭Connection: conn.close()





my first website using web framework Web Programming

Python Web Framework

- Flask
- Django
- Web.py
- Tornado
- Bottle





Install Flask: pip install flask

D:\SISU\新媒体数据分析与应用\Lecture 4\Flask>pip install flask Collecting flask Using cached Flask-0.11.1-py2.py3-none-any.whl Collecting Jinja2>=2.4 (from flask) Using cached Jinja2-2.8-py2.py3-none-any.whl Collecting click>=2.0 (from flask) Using cached click-6.6.tar.gz Collecting Werkzeug>=0.7 (from flask) Using cached Werkzeug-0.11.11-py2.py3-none-any.whl Collecting itsdangerous>=0.21 (from flask) Using cached itsdangerous-0.24.tar.gz Collecting MarkupSafe (from Jinja2>=2.4->flask) Using cached MarkupSafe-0.23.tar.gz Installing collected packages: MarkupSafe, Jinja2, click, Werkzeug, itsdangerous flask Running setup.py install for MarkupSafe ... done Running setup.py install for click ... done Running setup.py install for itsdangerous ... done Successfully installed Jinja2-2.8 MarkupSafe-0.23 Werkzeug-0.11.11 click-6.6 fla sk-0.11.1 itsdangerous-0.24







Sign-in options



us 🧖 🕁 🛈

Login









Reference



Django

http://www.ziqiangxuetang.com/django/django
 -tutorial.html

Python操作MySQL数据库9个实用实例

• http://www.jb51.net/article/76231.htm





Home Work

Home Work

Design a simple web site and connect your databases to this web site (deadline: Oct.12)

- It should contain:
 - Source code, including Registration and Login
 - Databases
 - A Report (very important!!)
- You may use any web frameworks you like.







IT WILL BE YOUR TIME IT WILL BE YOUR TURN OCTOBER 12, 2016



- 1. 4 groups, 20min for each, where 15min for presentation, and 5min for questions;
- 2. The speaker should use a PPT to show their business plan;
- 3. Only one speaker in the stage of presentation, but his/her team member can help them in the stage of questions.



Tips: How to write a business plan in ten pages?

- 1. What is the problem?
- 2. How to solve it?
- 3. Who is your customer?
- 4. How big is your market?
- 5. Your core competence (monopoly or sales? If no, then technology)

- 6. Technical methodology
- 7. Your plan and schedule
- 8. How to get money?
- 9. Your team
- 10. Investment you have got



Reference to Business Plan

- http://blog.sina.com.cn/s/blog_4a01359b0102
 wnbm.html
- http://tech2ipo.com/54752







The End of Lecture 4

Thank You

http://www.wangting.ac.cn

