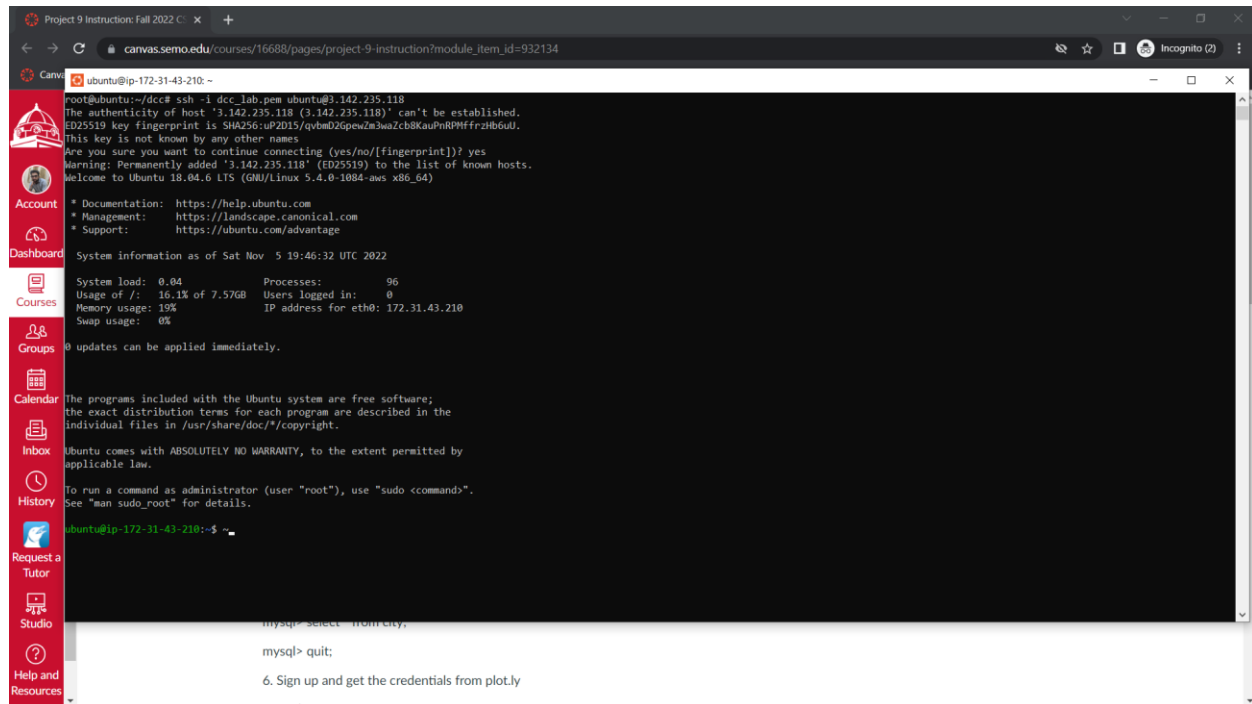
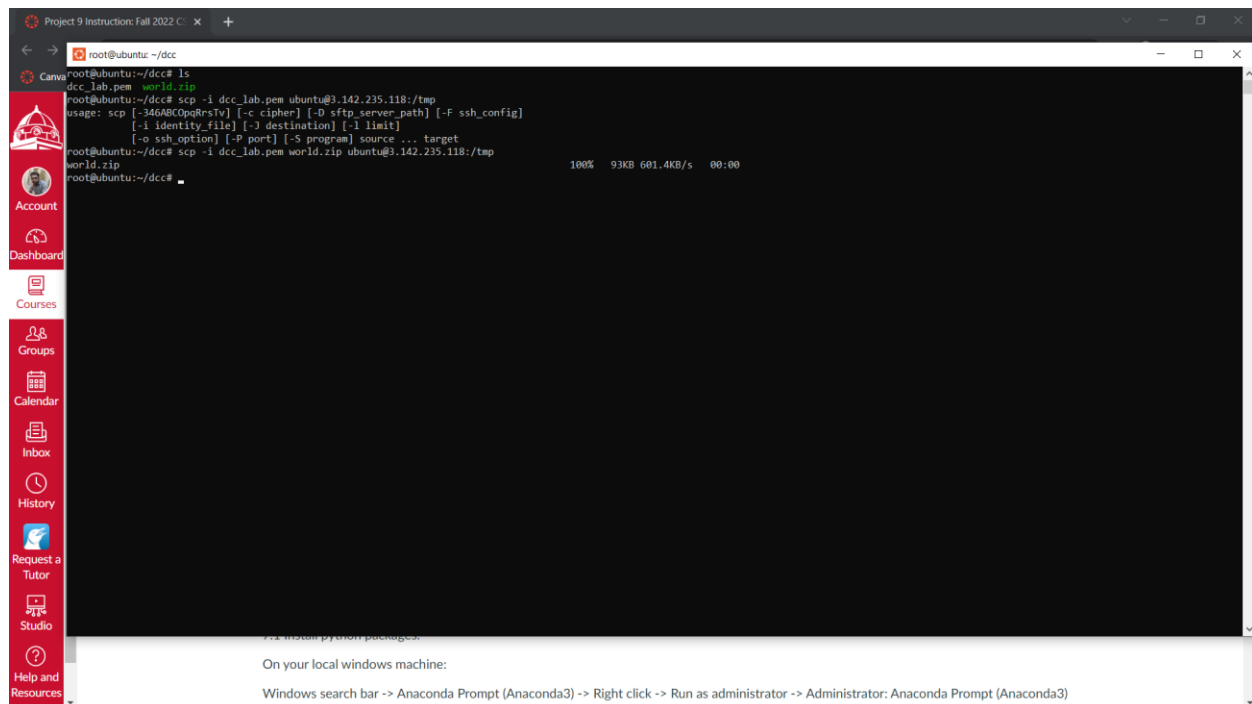


1. Copy the file world.zip to the cloud folder on **your EC2 instance** by using scp command.



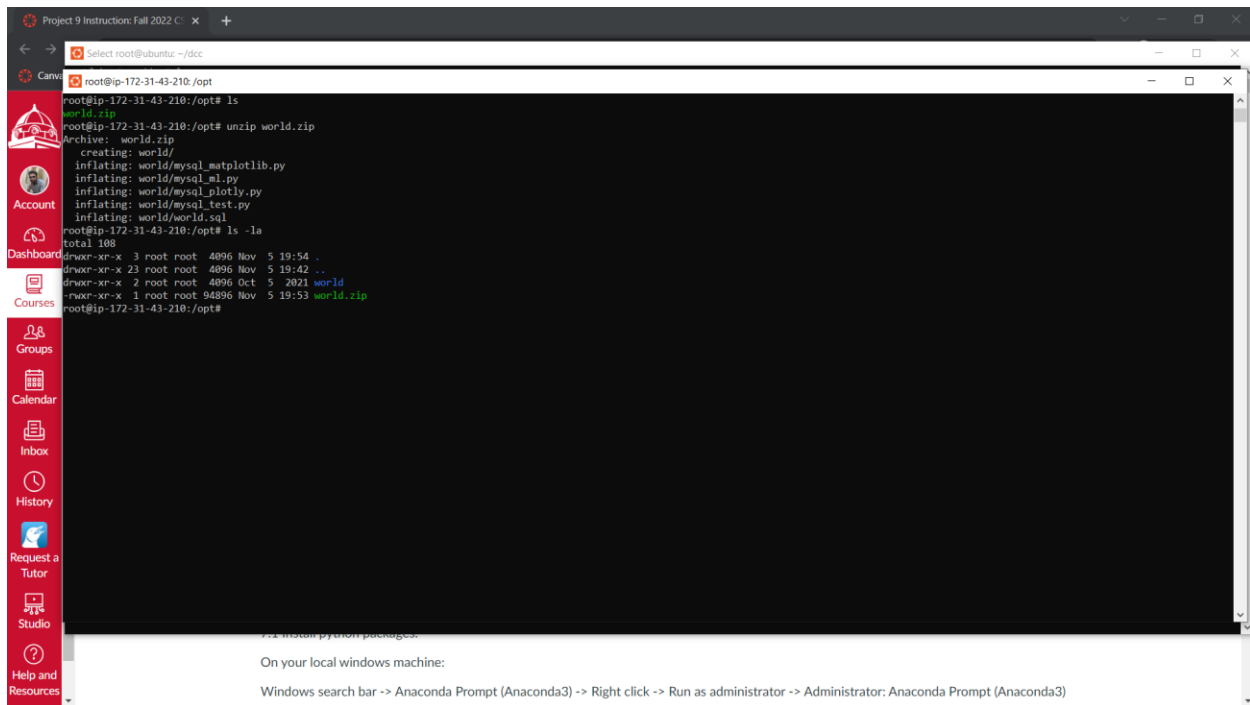
The screenshot shows a terminal window with a red sidebar on the left containing navigation links like Account, Dashboard, Courses, Groups, Calendar, Inbox, History, Request a Tutor, Studio, and Help and Resources. The terminal output shows the user running 'ssh -i dcc_lab.pem ubuntu@3.142.235.118'. It displays the host's fingerprint, a warning about permanently adding it to the list of known hosts, and system information for Ubuntu 18.04.6 LTS. The user is prompted to confirm the connection, and they respond 'yes'. The terminal then shows the system information as of Sat Nov 5 19:46:32 UTC 2022, including system load, processes, memory usage, and IP address.

2. . SSH to your EC2 instance.

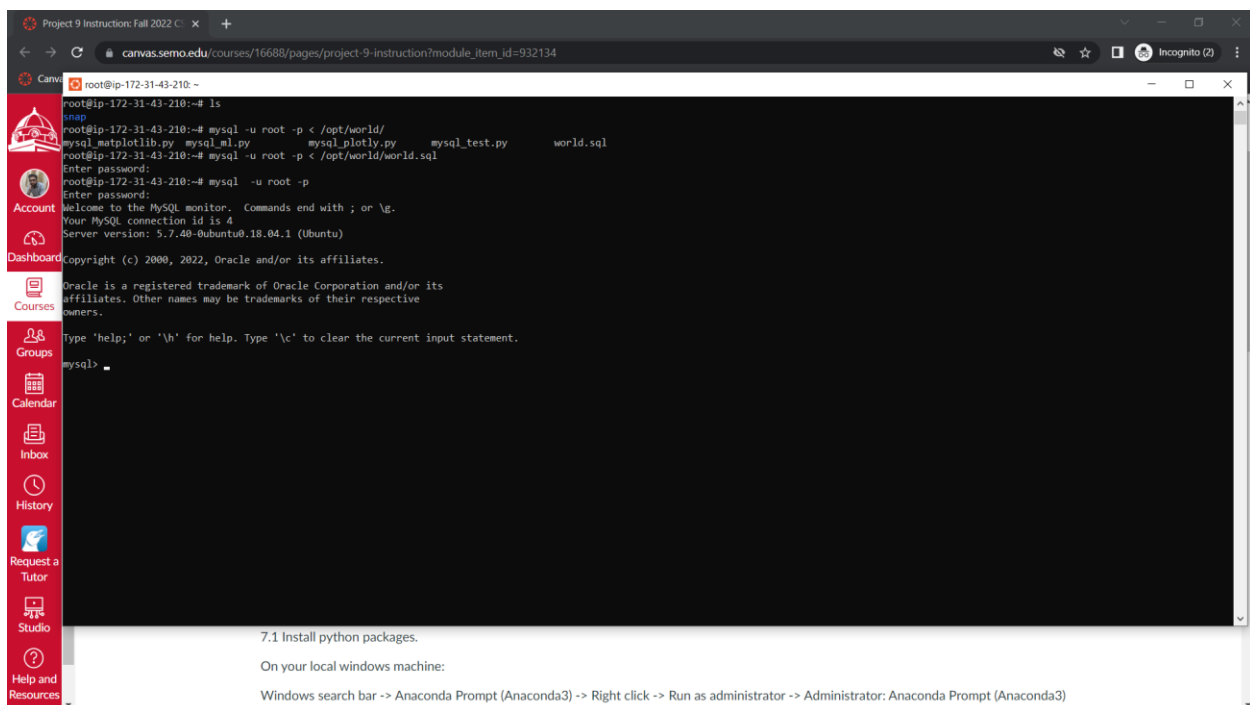


The screenshot shows the same terminal window as before, but now the user is running the 'scp' command to copy a file. The command is 'scp -i dcc_lab.pem world.zip ubuntu@3.142.235.118:/tmp'. The terminal output shows the usage of the scp command and the progress of the file transfer. A progress bar is visible at the bottom of the terminal window, showing 100% completion. The file size is 93KB, and the transfer speed is 601.4KB/s. The transfer time is 00:00.

3. Unzip the file on **your EC2 instance** by using unzip command.



4. Import the database



Project 9 Instructions: Fall 2022 C x +

canvas.semo.edu/courses/16688/pages/project-9-instruction?module_item_id=932134

root@ip-172-31-43-210:~

```
mysql -u root -p < /opt/world/
mysql_matplotlib.py mysql_ml.py mysql_plotly.py world.sql
root@ip-172-31-43-210:~# mysql -u root -p < /opt/world/world.sql
Enter password:
Enter password:
Welcome to the MySQL monitor. Commands end with ; or \g.
Your MySQL connection id is 4
Server version: 5.7.40-0ubuntu0.18.04.1 (Ubuntu)
Copyright (c) 2000, 2022, Oracle and/or its affiliates.
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 |
| sys |
| world |
+-----+
5 rows in set (0.00 sec)

mysql> use world;
Reading table information for completion of table and column names
You can turn off this feature to get a quicker startup with -A

Database changed
mysql> ALTER USER 'root'@'localhost' IDENTIFIED WITH mysql_native_password BY '1234';
Query OK, 0 rows affected (0.00 sec)

mysql>
```

7.1 Install python packages.

On your local windows machine:

Windows search bar -> Anaconda Prompt (Anaconda3) -> Right click -> Run as administrator -> Administrator: Anaconda Prompt (Anaconda3)

root@ip-172-31-43-210:~

```
mysql> use world;
Reading table information for completion of table and column names
You can turn off this feature to get a quicker startup with -A

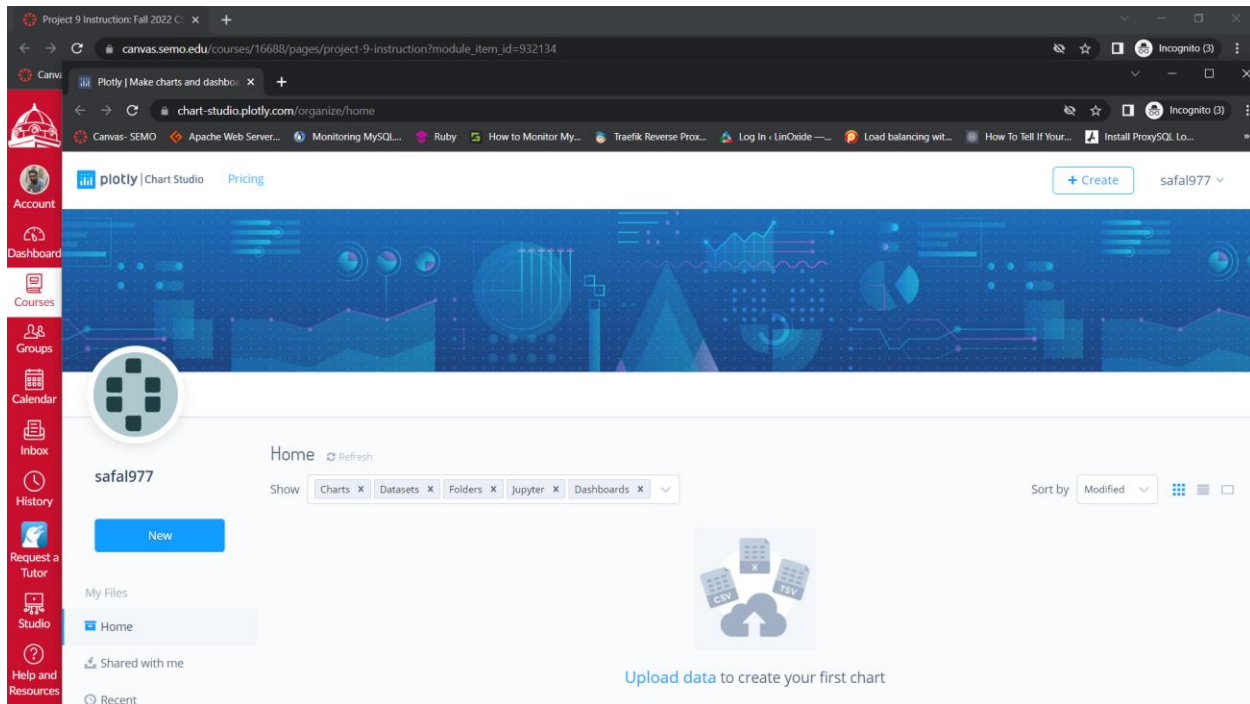
Database changed
mysql> ALTER USER 'root'@'localhost' IDENTIFIED WITH mysql_native_password BY '1234';
Query OK, 0 rows affected (0.00 sec)

mysql> show tables;
+-----+
| Tables_in_world |
+-----+
| city |
| country |
| countrylanguage |
+-----+
3 rows in set (0.00 sec)

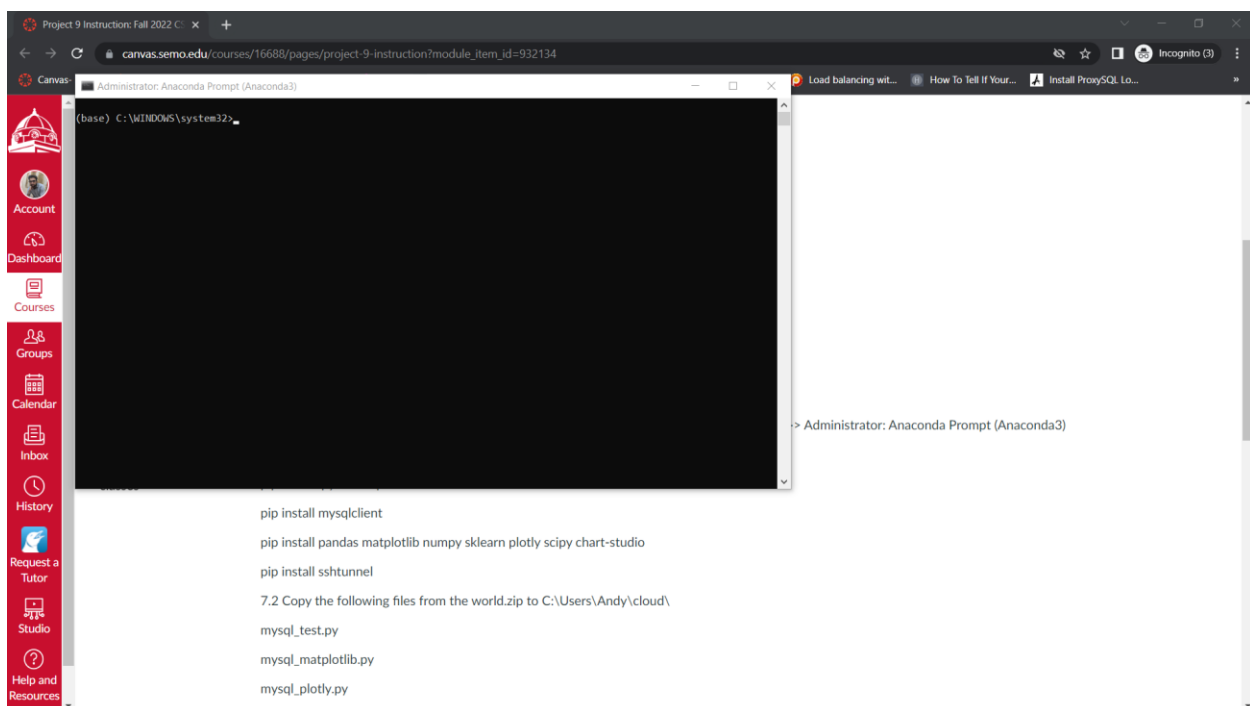
mysql> select * from city;
```

ID	Name	CountryCode	District	Population
1	Kabul	AFG	Kabul	1780000
2	Qandahar	AFG	Qandahar	237500
3	Herat	AFG	Herat	186800
4	Mazar-e-Sharif	AFG	Balkh	127800
5	Amsterdam	NLD	Noord-Holland	731200
6	Rotterdam	NLD	Zuid-Holland	593321
7	Haag	NLD	Zuid-Holland	446900
8	Utrecht	NLD	Utrecht	234323
9	Eindhoven	NLD	Noord-Brabant	201843
10	Tilburg	NLD	Noord-Brabant	193238
11	Groningen	NLD	Groningen	172701
12	Breda	NLD	Noord-Brabant	166398
13	Apeldoorn	NLD	Gelderland	153491
14	Nijmegen	NLD	Gelderland	152463
15	Enschede	NLD	Overijssel	149544
16	Haarlem	NLD	Noord-Holland	148772
17	Almere	NLD	Flevoland	142465
18	Arnhem	NLD	Gelderland	138020
19	Zaanstad	NLD	Noord-Holland	135621
20	't Hartogenbosch	NLD	Noord-Brabant	129370
21	Amersfoort	NLD	Utrecht	126270
22	Maastricht	NLD	Limburg	122087
23	Dordrecht	NLD	Zuid-Holland	119811
24	Leiden	NLD	Zuid-Holland	117196
25	Haarlemmermeer	NLD	Noord-Holland	110722
26	Zoetermeer	NLD	Zuid-Holland	118214
27	Essen	NLD	Drenthe	105853

6. Sign up and get the credentials from plot.ly



7.1 Install python packages.



pip install pip update --user

pip install ipython-sql

```
Project Administrator: Anaconda Prompt (Anaconda3)
< -> (base) C:\WINDOWS\system32>pip install pip update --user
Requirement already satisfied: pip in c:\programdata\anaconda3\lib\site-packages (22.2.2)
Collecting update
  Downloading update-0.0.1-py2.py3-none-any.whl (2.9 kB)
Collecting style==1.1.0
  Downloading style-1.1.0-py2.py3-none-any.whl (6.4 kB)
Installing collected packages: style, update
Successfully installed style-1.1.0 update-0.0.1

(base) C:\WINDOWS\system32>pip install ipython-sql
Collecting ipython-sql
  Downloading ipython_sql-0.4.1-py3-none-any.whl (21 kB)
Requirement already satisfied: ipython-genutils<0.1.0 in c:\programdata\anaconda3\lib\site-packages (from ipython-sql) (0.2.0)
Requirement already satisfied: sqlalchemy>0.6.7 in c:\programdata\anaconda3\lib\site-packages (from ipython-sql) (1.4.39)
Requirement already satisfied: six in c:\programdata\anaconda3\lib\site-packages (from ipython-sql) (1.16.0)
Collecting prettytable
  Downloading prettytable-0.7.2.zip (28 kB)
  Preparing metadata (setup.py) ... done
Collecting sqlparse
  Downloading sqlparse-0.4.3-py3-none-any.whl (42 kB)
----- 42.8/42.8 kB 2.0 MB/s eta 0:00:00
Requirement already satisfied: ipython>1.0 in c:\programdata\anaconda3\lib\site-packages (from ipython-sql) (7.31.1)
Requirement already satisfied: pygments in c:\programdata\anaconda3\lib\site-packages (from ipython>1.0->ipython-sql) (2.11.2)
Requirement already satisfied: setuptools>18.5 in c:\programdata\anaconda3\lib\site-packages (from ipython>1.0->ipython-sql) (63.4.1)
Requirement already satisfied: traitlets>4.2 in c:\programdata\anaconda3\lib\site-packages (from ipython>1.0->ipython-sql) (5.1.1)
Requirement already satisfied: decorator in c:\programdata\anaconda3\lib\site-packages (from ipython>1.0->ipython-sql) (5.1.1)
Requirement already satisfied: backcall in c:\programdata\anaconda3\lib\site-packages (from ipython>1.0->ipython-sql) (0.2.0)
Requirement already satisfied: prompt-toolkit<3.0.0,!=3.0.1,<3.1.0,>=2.0.0 in c:\programdata\anaconda3\lib\site-packages (from ipython>1.0->ipython-sql) (3.0.20)
Requirement already satisfied: colorama in c:\programdata\anaconda3\lib\site-packages (from ipython>1.0->ipython-sql) (0.4.5)
Requirement already satisfied: pickleshare in c:\programdata\anaconda3\lib\site-packages (from ipython>1.0->ipython-sql) (0.7.5)
Requirement already satisfied: matplotlib-inline in c:\programdata\anaconda3\lib\site-packages (from ipython>1.0->ipython-sql) (0.1.6)
Requirement already satisfied: jedi>0.16 in c:\programdata\anaconda3\lib\site-packages (from ipython>1.0->ipython-sql) (0.18.1)
Requirement already satisfied: greenlet<0.4.17 in c:\programdata\anaconda3\lib\site-packages (from sqlalchemy>0.6.7->ipython-sql) (1.1.1)
Requirement already satisfied: parsoc<0.9.0,>=0.8.0 in c:\programdata\anaconda3\lib\site-packages (from jedi>0.16->ipython>1.0->ipython-sql) (0.8.3)
Requirement already satisfied: wcwidth in c:\programdata\anaconda3\lib\site-packages (from prompt-toolkit<3.0.0,!=3.0.1,<3.1.0,>=2.0.0->ipython>1.0->ipython-sql) (0.2.5)
Building wheels for collected packages: prettytable
  Building wheel for prettytable (setup.py) ... done
  Created wheel for prettytable: filename=prettytable-0.7.2-py3-none-any.whl size=13695 sha256=3c9beb866381532742148f9379ebadcf32b5db09aba84e55eb1fb9c971bcab13
  Stored in directory: c:\users\koira\appdata\local\pip\cache\wheels\75\7f\28\77a076f1a8cbda61aca712815d0847a32435f04a26a2dd7b
Successfully built prettytable
Installing collected packages: prettytable, sqlparse, ipython-sql
Successfully installed ipython-sql-0.4.1 prettytable-0.7.2 sqlparse-0.4.3

(base) C:\WINDOWS\system32>
(base) C:\WINDOWS\system32>
```

pip install mysqlclient

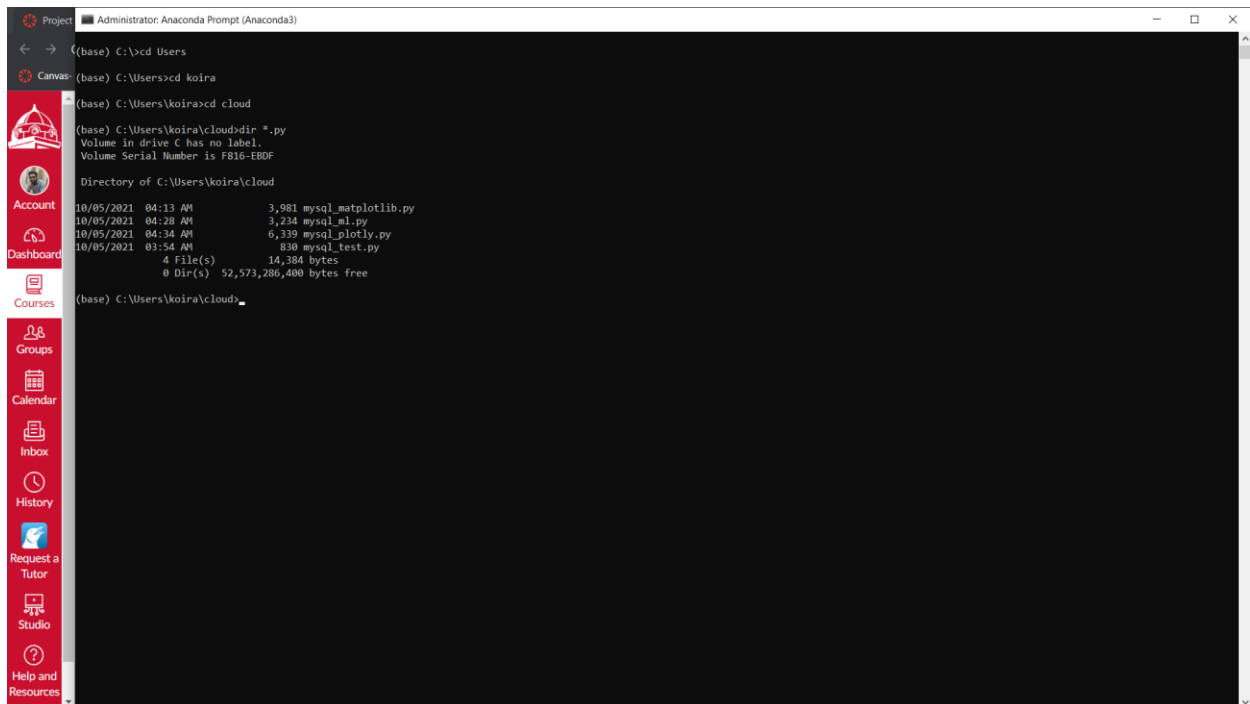
pip install pandas matplotlib numpy sklearn plotly scipy chart-studio

pip install sshunnel

```
Project Administrator: Anaconda Prompt (Anaconda3)
< -> (base) C:\WINDOWS\system32>pip install pandas matplotlib numpy sklearn plotly scipy chart-studio
Requirement already satisfied: pandas in c:\programdata\anaconda3\lib\site-packages (2.0.2)
Requirement already satisfied: matplotlib in c:\programdata\anaconda3\lib\site-packages (3.5.2)
Requirement already satisfied: numpy in c:\programdata\anaconda3\lib\site-packages (1.24.2)
Requirement already satisfied: sklearn in c:\programdata\anaconda3\lib\site-packages (1.2.2)
Requirement already satisfied: plotly in c:\programdata\anaconda3\lib\site-packages (5.10.0)
Requirement already satisfied: scipy in c:\programdata\anaconda3\lib\site-packages (1.9.1)
Collecting chart-studio
  Downloading chart_studio-1.1.0-py3-none-any.whl (64 kB)
----- 64.4/64.4 kB 3.6 MB/s eta 0:00:00
Requirement already satisfied: pytz>2020.1 in c:\programdata\anaconda3\lib\site-packages (from pandas) (2022.1)
Requirement already satisfied: python-dateutil>2.8.1 in c:\programdata\anaconda3\lib\site-packages (from pandas) (2.8.2)
Requirement already satisfied: packaging>20.0 in c:\programdata\anaconda3\lib\site-packages (from matplotlib) (21.3)
Requirement already satisfied: kiwisolver>1.0.1 in c:\programdata\anaconda3\lib\site-packages (from matplotlib) (1.4.2)
Requirement already satisfied: pillow>2.0 in c:\programdata\anaconda3\lib\site-packages (from matplotlib) (9.2.0)
Requirement already satisfied: fonttools>4.22.0 in c:\programdata\anaconda3\lib\site-packages (from matplotlib) (4.25.0)
Requirement already satisfied: cycler>0.10 in c:\programdata\anaconda3\lib\site-packages (from matplotlib) (0.11.0)
Requirement already satisfied: pyparsing>2.2.1 in c:\programdata\anaconda3\lib\site-packages (from matplotlib) (3.0.9)
Requirement already satisfied: scikit-learn in c:\programdata\anaconda3\lib\site-packages (from sklearn) (1.0.2)
Requirement already satisfied: tenacity>6.2.0 in c:\programdata\anaconda3\lib\site-packages (from plotly) (8.0.1)
Requirement already satisfied: requests in c:\programdata\anaconda3\lib\site-packages (from chart-studio) (2.28.1)
Collecting retrying>1.3.3
  Downloading retrying-1.3.3.tar.gz (10 kB)
  Preparing metadata (setup.py) ... done
Requirement already satisfied: six in c:\programdata\anaconda3\lib\site-packages (from chart-studio) (1.16.0)
Requirement already satisfied: certifi>2017.4.17 in c:\programdata\anaconda3\lib\site-packages (from requests->chart-studio) (2022.9.14)
Requirement already satisfied: idna<3,>=2.5 in c:\programdata\anaconda3\lib\site-packages (from requests->chart-studio) (3.3)
Requirement already satisfied: charset-normalizer<3,>=2 in c:\programdata\anaconda3\lib\site-packages (from requests->chart-studio) (2.0.4)
Requirement already satisfied: urllib3<1.27,>=1.21.1 in c:\programdata\anaconda3\lib\site-packages (from requests->chart-studio) (1.26.11)
Requirement already satisfied: joblib>0.11 in c:\programdata\anaconda3\lib\site-packages (from scikit-learn->sklearn) (1.1.0)
Requirement already satisfied: threadpoolctl>2.0.0 in c:\programdata\anaconda3\lib\site-packages (from scikit-learn->sklearn) (2.2.0)
Building wheels for collected packages: sklearn, retrying
  Building wheel for sklearn (setup.py) ... done
  Created wheel for sklearn: filename=sklearn-0.0-py2.py3-none-any.whl size=1304 sha256=6bd286bedd4970c7b3101c3a2b831357675043092758560b9370c8eb477aa
  Stored in directory: c:\users\koira\appdata\local\pip\cache\wheels\e4\7b\98\b6466d71b8d738a0c547008b9eb39f8f67d1ff6ca4b22af1c
  Building wheel for retrying (setup.py) ... done
  Created wheel for retrying: filename=retrying-1.3.3-py3-none-any.whl size=11431 sha256=c5a521e73d9c9bfbfeda044ec0e7ea0126a1cc178d714c7a7079ff91e40c01
  Stored in directory: c:\users\koira\appdata\local\pip\cache\wheels\ce\18\7f\9527e3e6db1456104ac7f61eb32118068409edceef2d31
Successfully built sklearn retrying
Installing collected packages: retrying, chart-studio, sklearn
Successfully installed chart-studio-1.1.0 retrying-1.3.3 sklearn-0.0

(base) C:\WINDOWS\system32>
(base) C:\WINDOWS\system32>pip install sshunnel
Collecting sshunnel
  Downloading sshunnel-0.4.0-py2.py3-none-any.whl (24 kB)
Requirement already satisfied: paramiko>2.7.2 in c:\programdata\anaconda3\lib\site-packages (from sshunnel) (2.8.1)
Requirement already satisfied: bcrypt>3.1.3 in c:\programdata\anaconda3\lib\site-packages (from paramiko>2.7.2->sshunnel) (3.2.0)
Requirement already satisfied: cryptography>2.5 in c:\programdata\anaconda3\lib\site-packages (from paramiko>2.7.2->sshunnel) (37.0.1)
Requirement already satisfied: pynacl>1.0.1 in c:\programdata\anaconda3\lib\site-packages (from paramiko>2.7.2->sshunnel) (1.5.0)
Requirement already satisfied: cffi>1.1 in c:\programdata\anaconda3\lib\site-packages (from bcrypt>3.1.3->paramiko>2.7.2->sshunnel) (1.15.1)
Requirement already satisfied: six>1.4.1 in c:\programdata\anaconda3\lib\site-packages (from bcrypt>3.1.3->paramiko>2.7.2->sshunnel) (1.16.0)
Requirement already satisfied: pycparser in c:\programdata\anaconda3\lib\site-packages (from cffi>1.1->bcrypt>3.1.3->paramiko>2.7.2->sshunnel) (2.21)
Installing collected packages: sshunnel
Successfully installed sshunnel-0.4.0
```

Copy the following files from the world.zip



```
Administrator: Anaconda Prompt (Anaconda3)
(base) C:\>cd Users
(base) C:\Users>cd koira
(base) C:\Users\koira>cd cloud
(base) C:\Users\koira\cloud>dir *.py
Volume in drive C has no label.
Volume Serial Number is F816-EBDF

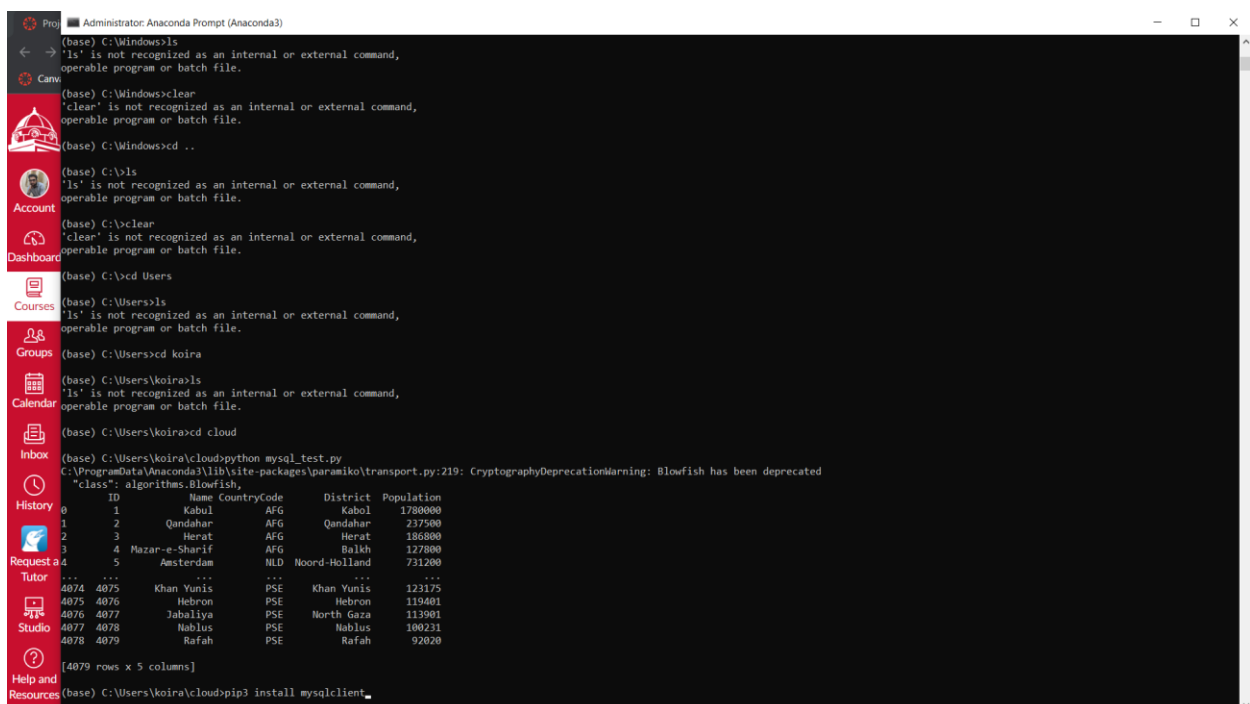
Directory of C:\Users\koira\cloud

10/05/2021  04:13 AM                3,981 mysql_matplotlib.py
10/05/2021  04:28 AM                3,234 mysql_ml.py
10/05/2021  04:34 AM                6,339 mysql_plotly.py
10/05/2021  03:54 AM                830 mysql_test.py
               4 File(s)            14,384 bytes
               0 Dir(s)  52,573,286,400 bytes free

(base) C:\Users\koira\cloud>
```

Test the connection between **your local windows machine** and remote mysql database **On your EC2 instance, go to your Anaconda Prompt (Administrator)**

Administrator: Anaconda Prompt (Anaconda3):



```
Administrator: Anaconda Prompt (Anaconda3)
(base) C:\Windows>ls
'ls' is not recognized as an internal or external command,
operable program or batch file.

(base) C:\Windows>clear
'clear' is not recognized as an internal or external command,
operable program or batch file.

(base) C:\Windows>cd ..
(base) C:\>ls
'ls' is not recognized as an internal or external command,
operable program or batch file.

(base) C:\>clear
'clear' is not recognized as an internal or external command,
operable program or batch file.

(base) C:\>cd Users
(base) C:\Users>ls
'ls' is not recognized as an internal or external command,
operable program or batch file.

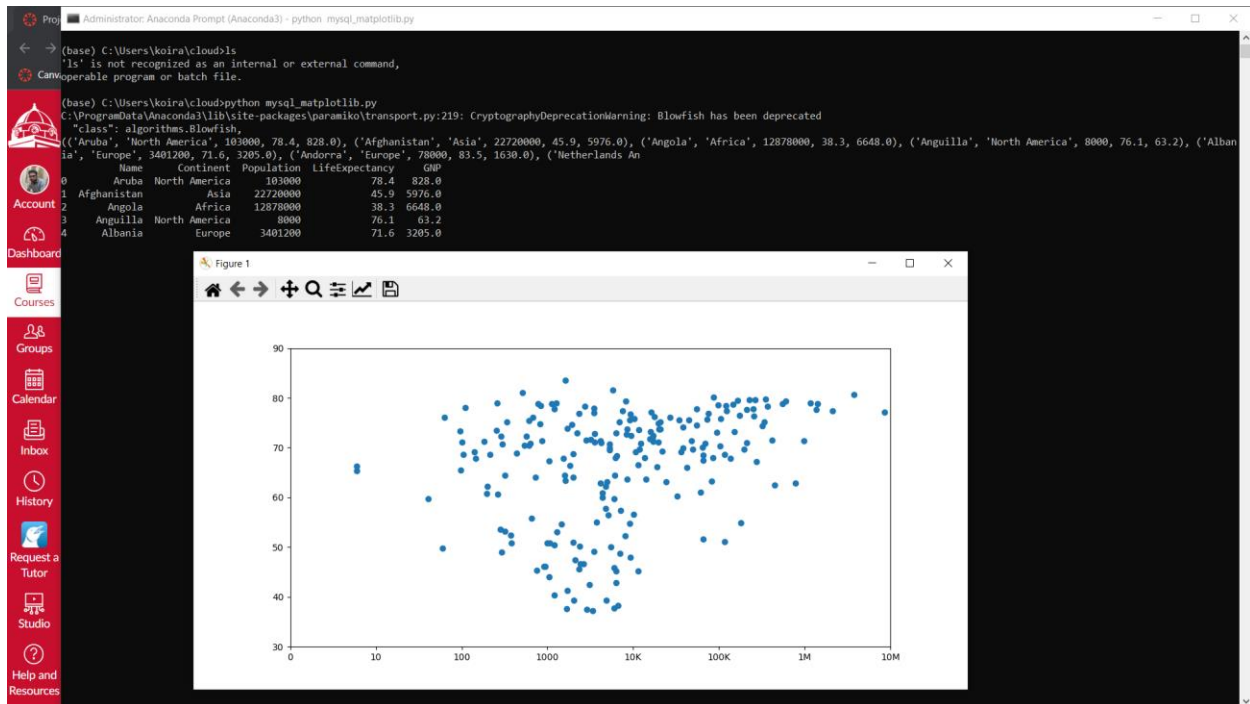
(base) C:\Users>cd koira
(base) C:\Users\koira>ls
'ls' is not recognized as an internal or external command,
operable program or batch file.

(base) C:\Users\koira>cd cloud
(base) C:\Users\koira\cloud>python mysql_test.py
C:\ProgramData\Anaconda3\lib\site-packages\paramiko\transport.py:219: CryptographyDeprecationWarning: Blowfish has been deprecated
"class": algorithms.Blowfish,
ID      Name CountryCode  District  Population
0      1      Kabul      AFG      Kabul      1780000
1      2      Qandahar   AFG      Qandahar   237500
2      3      Herat      AFG      Herat      186800
3      4      Mazar-e-Sharif AFG      Balkh      127800
4      5      Amsterdam  NLD      Noord-Holland 731200
...      ...      ...      ...      ...
4874  4875  Khan Yunis PSE      Khan Yunis  123175
4875  4876  Hebron     PSE      Hebron     119401
4876  4877  Jabaliya   PSE      North Gaza  113901
4877  4878  Nablus     PSE      Nablus     100231
4878  4879  Rafah      PSE      Rafah      92020

[4879 rows x 5 columns]
(base) C:\Users\koira\cloud>pip3 install mysqlclient
```

8. Data visualization with matplotlib and MySQL database on cloud

python mysql_matplotlib.py



python mysql_plotly.py

Project 9 Instructions: Fall 2022 C: x +

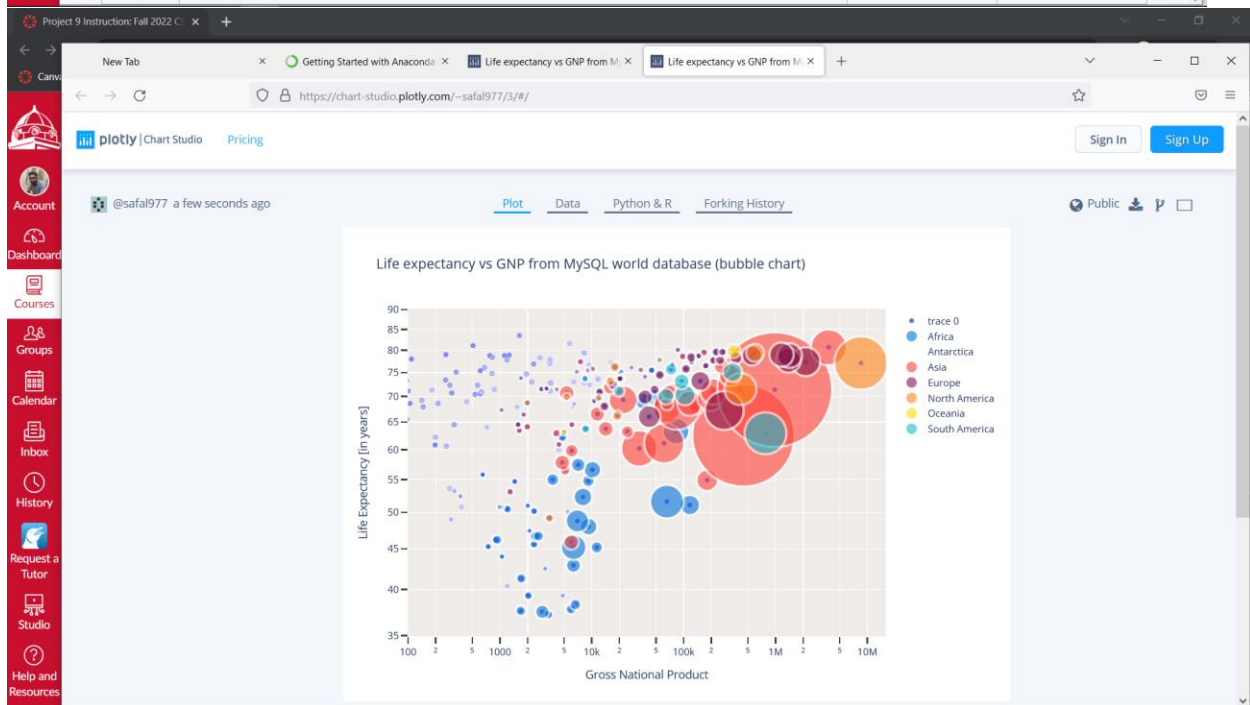
New Tab x Getting Started with Anaconda x Life expectancy vs GNP from M: x Life expectancy vs GNP from M: x +

← → ↻ https://chart-studio.plotly.com/~safal977/1/#data

plotly | Chart Studio Pricing Sign In Sign Up

@safal977 a minute ago Plot Data Python & R Forking History Public

	data:0:text	data:0:x	data:0:y
0	Zambia	3377	37.2
1	République	2891	37.5
2	Niawi	1687	37.6
3	Zimbabwe	5951	37.8
4	Angola	6648	38.3
5	Botswana	4834	39.3
6	Swazila	2856	39.3
7	Swaziland	1296	40.4
8	Niger	1790	41.3
9	Namibia	3181	42.5
10	Uganda	6313	42.9
11	Central African Republic	1054	44
12	Ethiopia	6353	45.2
13	Côte d'Ivoire	11345	45.2
14	Sierra Leone	746	45.3
15	Guinea	1392	45.6
16	Afghanistan	1976	45.9
17	East Timor	0	46
18	Burundi	983	46.2
19	Somalia	935	46.2
20
21	San Marino	318	81.1
22	Macao	5740	81.6
23	Andorra	1630	83.5
24	Antarctica	0	
25	French Southern territories	0	
26	Bouvet Island	0	
27	Cocos (Keeling) Islands	0	
28	Christmas Island	0	



python mysql_ml.py

The screenshot shows a Windows desktop environment. On the left side, there is a vertical sidebar containing several icons representing different applications or tools, such as a file explorer, a calendar, an inbox, and a help section. The main area of the screen is occupied by a black terminal window titled "Administrator: Anaconda Prompt (Anaconda3)". Inside the terminal, a series of commands are being executed, primarily involving the installation and use of the `requests` library and the `mysql-ml` package. The output of these commands includes version information for various libraries like `numpy`, `pandas`, and `matplotlib`, as well as a warning about the deprecated Blowfish cipher. A large portion of the terminal's output is a detailed JSON response from a REST client, which contains a table of world statistics. This table lists countries with their names, continents, populations, life expectancies, and GDP values. The countries listed include Zambia, Mozambique, Poland, Zimbabwe, Angola, Aruba, Afghanistan, Bangladesh, Angola, Anguilla, Albania, and others. The JSON is formatted with indentation and line numbers (237, 148, 238, etc.) visible on the left margin of the terminal output.