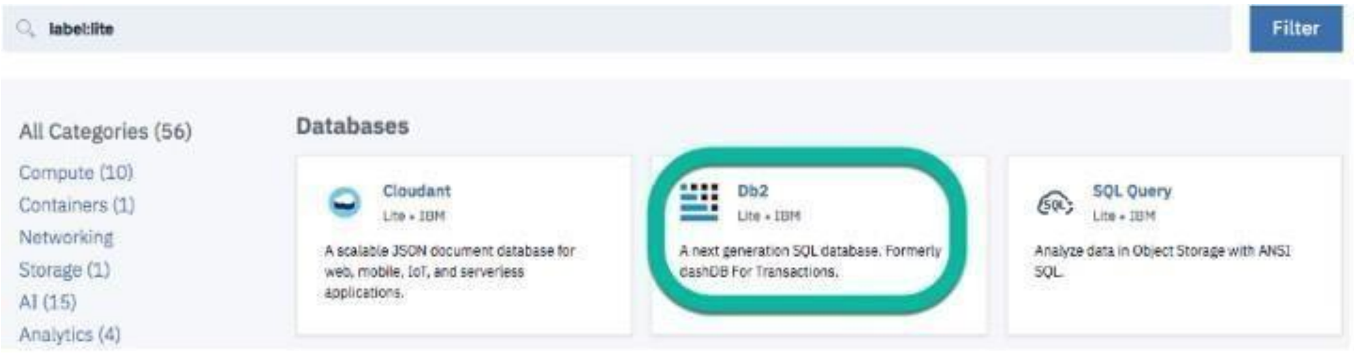
INVENTORYMANAGEMENTSYSTEMFORRETAILERS

Domain:CloudApplicationDevelopment

TeamID	PNT2022TMID31378
ProjectName	InventoryManagementSystemforRetailers

CreateIBMDB2Andconnectwithpython

InordertousetheIBMDB2DBMS,youhavetomakeaIBMcloud account.Thereis anIBMDB2Liteplanthatisfreetouse.
Gotothislink:https://cloud.ibm.com/registrationtomakeanIBMcloudaccount.
AfterlogginginyourIBMcloudaccount.Youwillnoticeacatalogoptiononthetopjusttothe leftofthesearchbar availableonthewebpage.
Aftergoinginthecatalogyouwillseethewebpagegivenbelow.

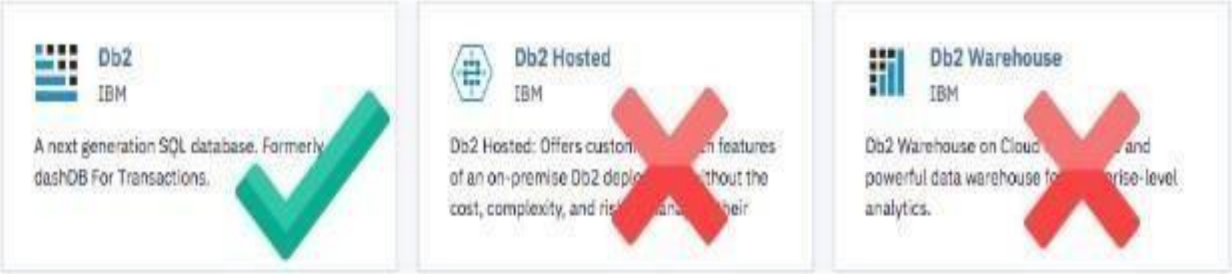


A scalable JSON document database for web, mobile, IoT, and serverless applications.

A next generation SQL database. Formerly dashDB For Transactions.

Analyze data in Object Storage with ANSI SQL.

MakesureyouchooseDB2andnothingelsesuchasDB2Warehouse,DB2HostedorSQLQuery.

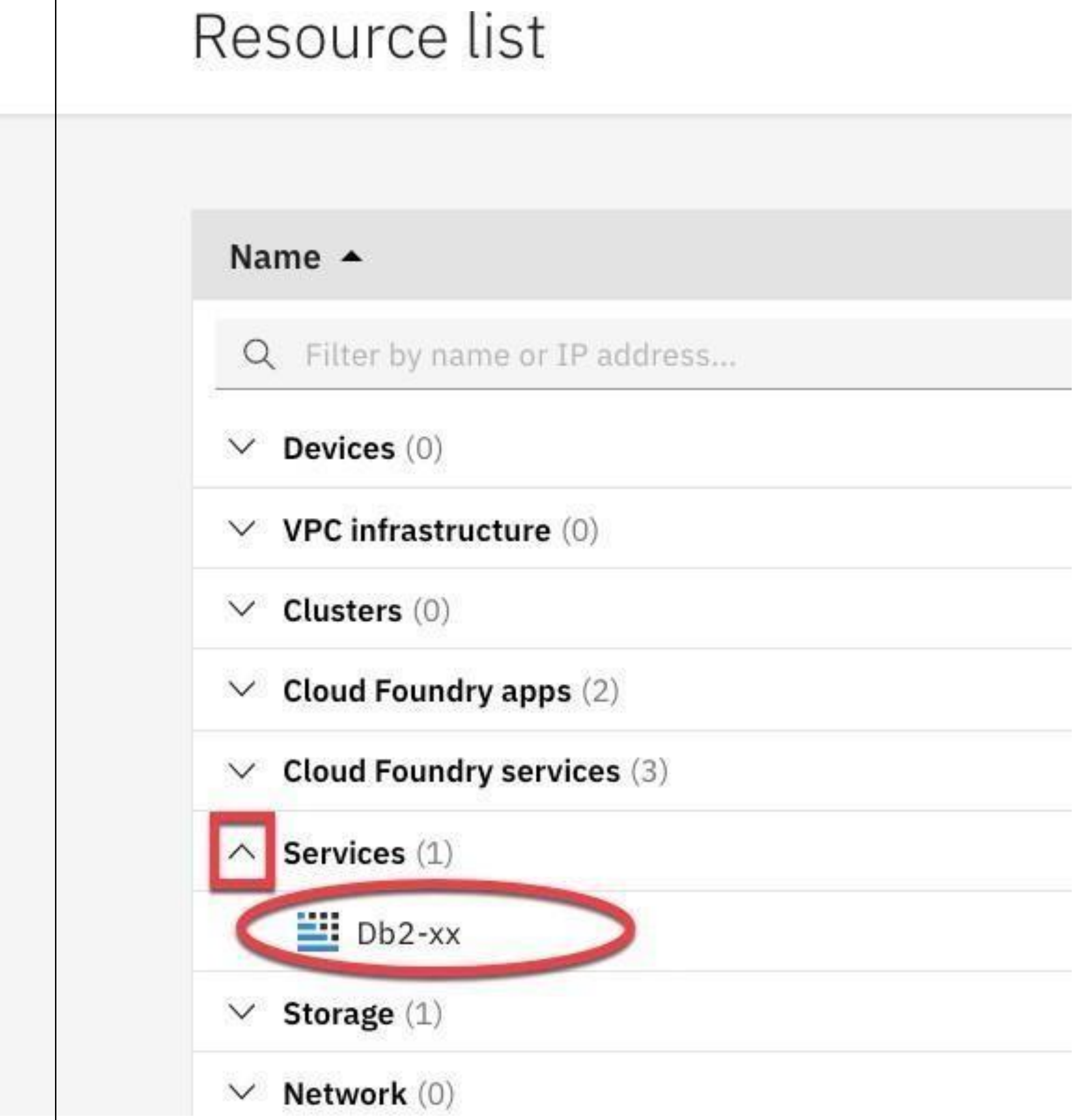


Db2
IBM
A next generation SQL database. Formerly dashDB For Transactions.

Db2 Hosted
IBM
Db2 Hosted: Offers custom n features of an on-premise Db2 deplo ithout the cost, complexity, and ris heir

Db2 Warehouse
IBM
Db2 Warehouse on Cloud and powerful data warehouse fo rise-level analytics.

Afterthateverythingwillbepre—selected,youjusthavetomovedowntoPricingPlansandselecttheLiteplanasitis afreeplan.



Resource list

ThenclickontheCreateatthebottomrightofthepage.Afterthat

openyourdashboardin theIBMcloud.

Afterthatclickontheopenconsole button.Thiswillopenanewtabonyourwebbrowserandthenchoosethe3rdoptionfromthetopleftdropdownmenu,nowifyouwanttorunSQLqueries.Youcandoitfromhere

WeneedtohaveServiceCredentialsinordertoaccessthedatabasefromPython.So,youhavetogotothewebpagewherethere isanOpenConsolebutton.

OntheleftsideyoucanseetheServiceCredentialsoption.Clickonthatbuttonandthenclick on the New Credentials button to generate Service Credentials for your IBM DB2Database.

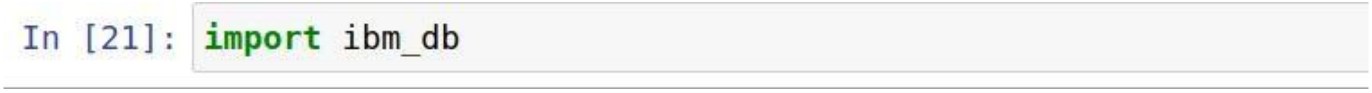
Wewillneedthecredentialslateron.

StartingwiththePythonCode

Firstofallyouneedtodownloadthepythonlibraryibm_db.

Youcanseehowtodownloadibm_dblibraryhere:*https://pypi.org/project/ibm-db/*

Afterthatyouhavetoimportibm_dbinthejupyternotebook.



```
In [21]: import ibm_db
```

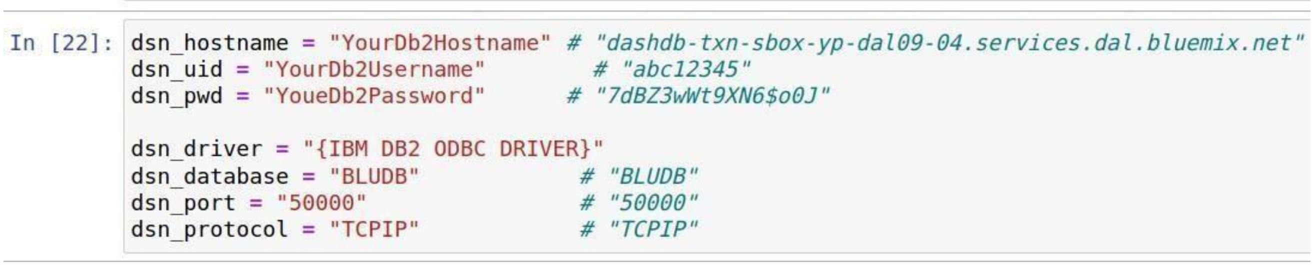
Thecredentialsthatyouwillbeneedingtoconnecttothedatabaseareasfollows:

1. DriverName
2. DatabaseName
3. HostDNSnameorIPAddress
4. HostPort

5. ConnectionProtocol

6. Username

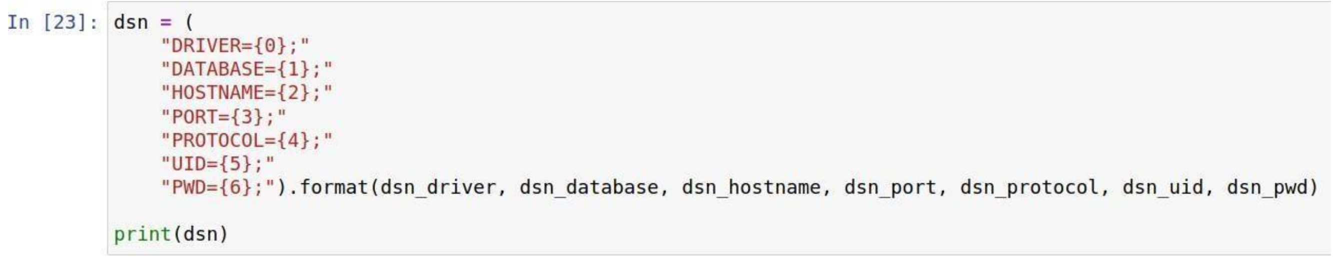
7. Password



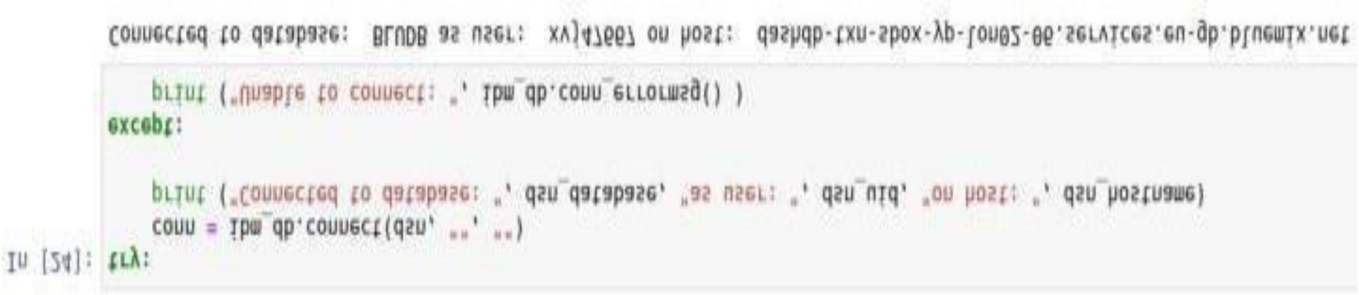
```
In [22]: dsn_hostname = "YourDb2Hostname" # "dashdb-txn-sbox-yp-dal09-04.services.dal.bluemix.net"
         dsn_uid = "YourDb2Username"        # "abc12345"
         dsn_pwd = "YoueDb2Password"      # "7dBZ3wWt9XN6$o0J"

         dsn_driver = "{IBM DB2 ODBC DRIVER}"
         dsn_database = "BLUDB"            # "BLUDB"
         dsn_port = "50000"                # "50000"
         dsn_protocol = "TCPIP"            # "TCPIP"
```

Thedsn_driverwillremainthesame.Othersmaychange,soyouhavetorefertothecredentialsinordertoreplacethevalues.

Theibm_dbAPIusestheIBMDataServerDriverforOpenDatabaseConnectivityandCommandLineInterfaceAPI'stoconnecttotheIBMDB2database.

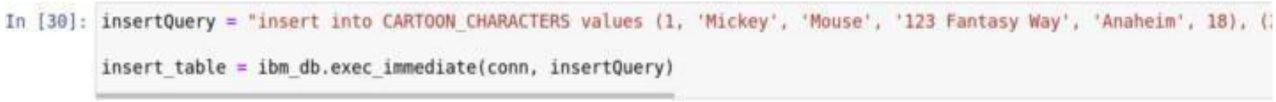


```
In [23]: dsn = (
             "DRIVER={0};"
             "DATABASE={1};"
             "HOSTNAME={2};"
             "PORT={3};"
             "PROTOCOL={4};"
             "UID={5};"
             "PWD={6};").format(dsn_driver, dsn_database, dsn_hostname, dsn_port, dsn_protocol, dsn_uid, dsn_pwd)

         print(dsn)
```

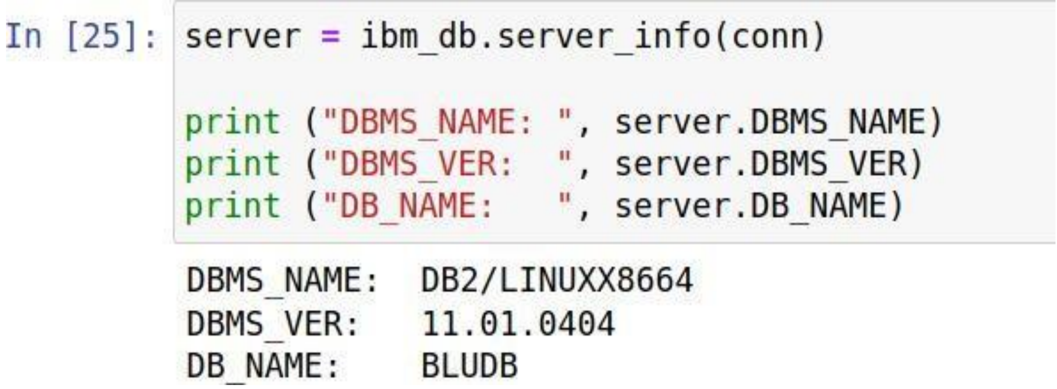


```
In [24]: try:
             conn = ibm_db.connect(dsn, "", "")
             print ("Connected to database: ", dsn_database, "as user: ", dsn_uid, "on host: ", dsn_hostname)

         except:
             print ("Unable to connect: ", ibm_db.conn_errormsg() )

         Connected to database:  BLUDB as user:  xvl41991 on host:  dashdb-txn-sbox-yp-lon02-09.services.eu-gb.bluemix.net
```

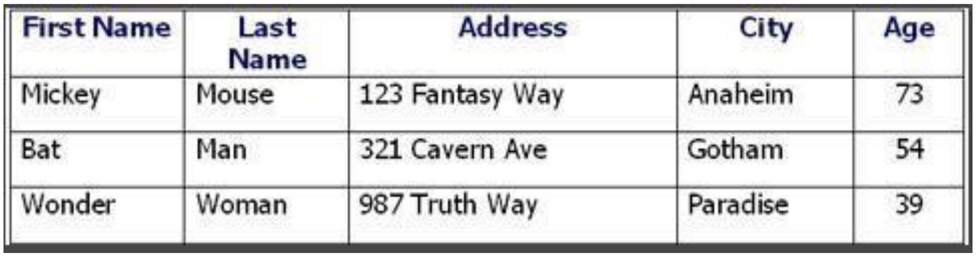
Youhavetoprinttheresultsinordertocheckifthedetailsarecorrect



```
In [30]: insertQuery = "insert into CARTOON_CHARACTERS values (1, 'Mickey', 'Mouse', '123 Fantasy Way', 'Anaheim', 18), (

         insert_table = ibm_db.exec_immediate(conn, insertQuery)
```

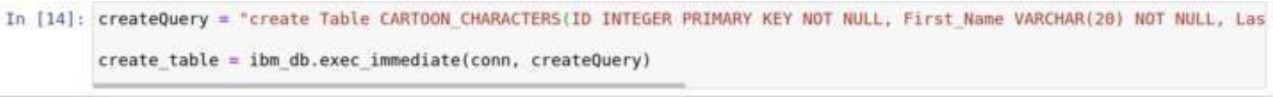


```
In [25]: server = ibm_db.server_info(conn)

         print ("DBMS_NAME: ", server.DBMS_NAME)
         print ("DBMS_VER:  ", server.DBMS_VER)
         print ("DB_NAME:   ", server.DB_NAME)

         DBMS_NAME:  DB2/LINUXX8664
         DBMS_VER:   11.01.0404
         DB_NAME:    BLUDB
```



First Name	Last Name	Address	City	Age
Mickey	Mouse	123 Fantasy Way	Anaheim	73
Bat	Man	321 Cavern Ave	Gotham	54
Wonder	Woman	987 Truth Way	Paradise	39

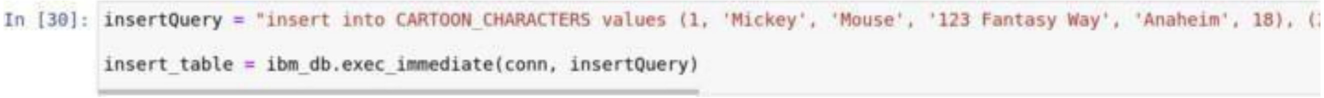
Firstofallwewillgivethequerytocreatetheabovetable.



```
In [14]: createQuery = "create Table CARTOON_CHARACTERS(ID INTEGER PRIMARY KEY NOT NULL, First_Name VARCHAR(20) NOT NULL, Las

         create_table = ibm_db.exec_immediate(conn, createQuery)
```

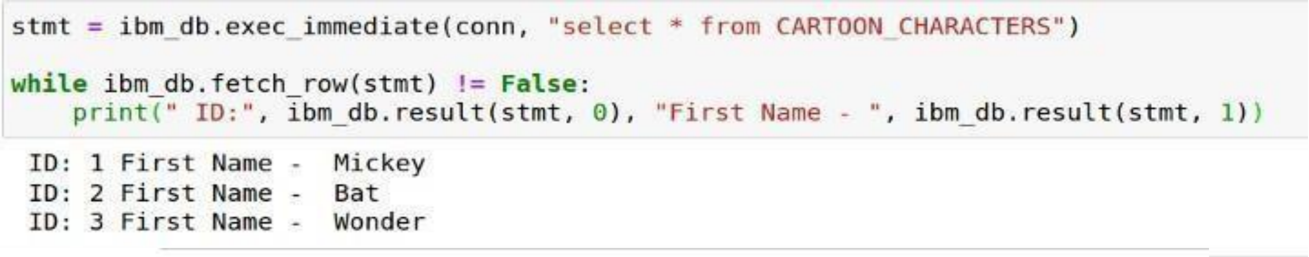
Here,ibm_db.exec_immediate()isthefunctionthatwillsendthequerytoyourIBMdatabaseandcreatechangesinthedatabase.

Nowwewillinsertallthedataintothedatabase.



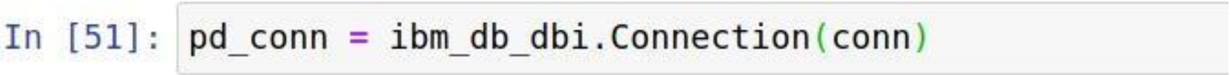
```
In [30]: insertQuery = "insert into CARTOON_CHARACTERS values (1, 'Mickey', 'Mouse', '123 Fantasy Way', 'Anaheim', 18), (

         insert_table = ibm_db.exec_immediate(conn, insertQuery)
```

Afterinsertingthedataintothedatabasewewillcheckifthetableinthedatahasbeenmodifiedornot,sowewillrunthefollowingcommand



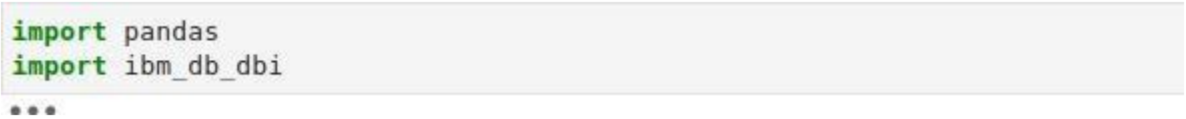
```
stmt = ibm_db.exec_immediate(conn, "select * from CARTOON_CHARACTERS")

while ibm_db.fetch_row(stmt) != False:
    print(" ID:", ibm_db.result(stmt, 0), "First Name - ", ibm_db.result(stmt, 1))
```

```
 ID: 1 First Name -  Mickey
 ID: 2 First Name -  Bat
 ID: 3 First Name -  Wonder
```



```
In [51]: pd_conn = ibm_db_dbi.Connection(conn)
```

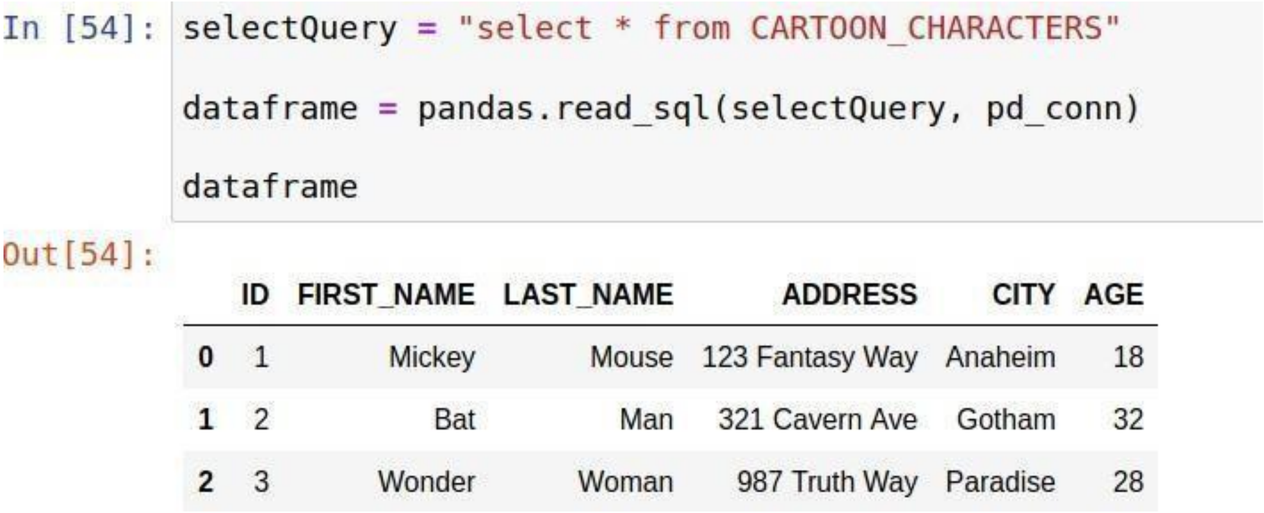
Now,thebestthingaboutaccessing databasesthroughpythonisthatyoucanloadthedatabaseinto Pandas data frame and you can use all the data science tools on the database using all thePythondatasciencelibraries.



```
import pandas
import ibm_db_dbi
```

Nowwehavetoestablishaconnectionforthepandas.

Afterestablishingtheconnection,nowwecan loadthedatabaseintothepandasdataframeI

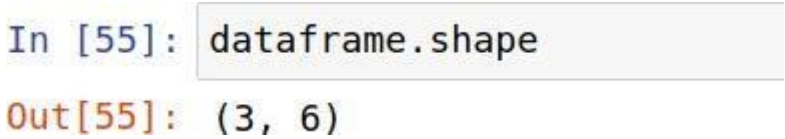


```
In [54]: selectQuery = "select * from CARTOON_CHARACTERS"

         dataframe = pandas.read_sql(selectQuery, pd_conn)

         dataframe
```

Out[54]:

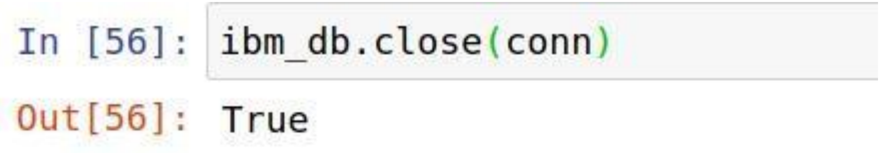
	ID	FIRST_NAME	LAST_NAME	ADDRESS	CITY	AGE
0	1	Mickey	Mouse	123 Fantasy Way	Anaheim	18
1	2	Bat	Man	321 Cavern Ave	Gotham	32
2	3	Wonder	Woman	987 Truth Way	Paradise	28

Nowyoucandothetypicalpandasoperationsonthedatabase.Forexample,youcanusetheshapefunctionofthepandas.



```
In [55]: dataframe.shape
Out[55]: (3, 6)
```

Wehavetofreeupalltheresourcesbyclosingtheconnection.Rememberthatitisveryimportant to close the connection so that we can avoid unused connections taking upresources.



```
In [56]: ibm_db.close(conn)
Out[56]: True
```