



TEXAS
Health and Human
Services

Texas Department of State
Health Services

Snowflake Connectivity Guide

**A Resource for DSHS SHARP Program
Participants**

Version 2.0

Last Updated on October 11th, 2022

Table of Contents

Section 1: Introduction to the Snowflake Connectivity Guide.....	3
A. Tool Connection Types.....	3
Section 2: Download the Snowflake ODBC Driver.....	3
Section 3: Configuring ODBC Driver	5
Section 4: Connecting to Applications	7
A. Connecting to Tableau Desktop with Native Connector	7
B. Connecting to ArcGIS Pro with ODBC	8
C. Connecting to SAS 9.4 (Desktop) with ODBC	11
D. Connecting to SAS Viya with ODBC.....	11
E. Connecting to Excel with ODBC	12
F. Connecting to Microsoft Power BI with Native Connector	12
F. Connecting to R with ODBC	15
F. Connecting to Python with Snowflake Connector.....	17
H. Connecting to Python with SQL Alchemy.....	18
Section 5: Additional Support.....	19
A. Help Desk Ticket Template to DSHS IT Department: ODBC Installation Request.....	19
B. Help Desk Ticket Template to DSHS IT Department: 443 Error	19
C. Additional Documentation	19

Section 1: Introduction to the Snowflake Connectivity Guide

As a SHARP program participant, this guide is designed to help you connect to your desired application through an ODBC or native connection to Snowflake. The guide will detail how to install and configure an ODBC driver and establish an ODBC or native connection to access the data in your Snowflake Account from an application such as Excel, Tableau, or Power BI.

Note: Generally, a native connection outperforms an ODBC connection; therefore, if an application or tool supports native and ODBC connections, choose the native connection. For Tableau specifically, a two-step process is required to establish a native connection: installing the ODBC driver first (see section 2), then installing the native connector.

Permissions

- To install the ODBC driver, you will need admin-level access on your device. If you do not have admin access, you can submit an IT Help Desk Ticket for assistance in installing the ODBC driver.
- To establish a native or ODBC connection, you will need your Snowflake credentials. Please reach out to the SHARP IT Team DL_DSHP_SHARP_IT_Ops_Support@hpsc.state.tx.us if you have not yet received your credentials.

The table below outlines which tools support native vs. ODBC connection.

A. Tool Connection Types

Tool	Native Connector	ODBC
Tableau Desktop	Yes	Yes
ArcGIS Pro	No	Yes
SAS Desktop	Yes (need a separate subscription)	Yes
SAS Viya	Yes (need a separate subscription)	Yes
Excel	No	Yes
Power BI	Yes	Yes
R	No	Yes
Python	Yes	No

Section 2: Download the Snowflake ODBC Driver

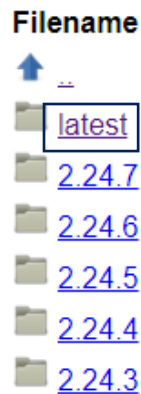
To download and install the Snowflake ODBC driver, you need administrative-level privileges so that the driver can be installed directly to the "C:\Program Files". If you do not have admin access, you can submit an IT Help Desk Ticket here <https://hhsconnection.hhs.texas.gov/it/help-desk>, for assistance installing the ODBC driver.

Generally, Helpdesk Support must install the Snowflake ODBC 64-bit driver. Reach out to the Helpdesk Support Team should you need assistance installing the driver.

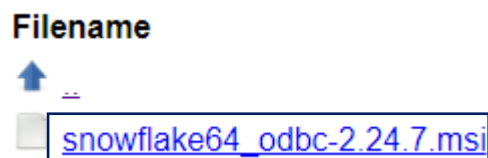
- A. Click on the following link: [Snowflake Repository \(snowflakecomputing.com\)](https://snowflakecomputing.com) and select the Windows 64-bit folder.



- B. Click on the "latest" folder.



- C. Click on the available file to download and run the file. Please contact your local IT department if the download fails or you cannot run the file.



- D. Continue through the driver setup making sure to install the Snowflake ODBC Driver to **C:\Program Files\Snowflake ODBC Driver**

E. More instructions:

- For installing and configuring the ODBC driver for windows, you can visit this [page](#).
- For general information on connecting to Snowflake, follow this [link](#).

Section 3: Configuring ODBC Driver

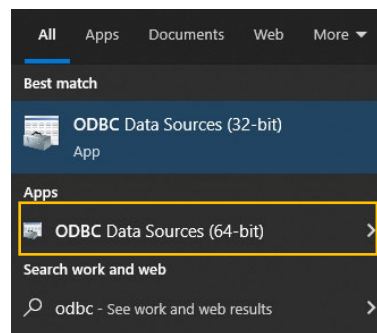
A. Global Protect (VPN) Users must follow the instructions below before proceeding. If you experience a connection error that reads “443 error,” update the cacert certificate below. If you update the file and still receive an error, please contact your IT Department and refer to [Section 5, B](#).

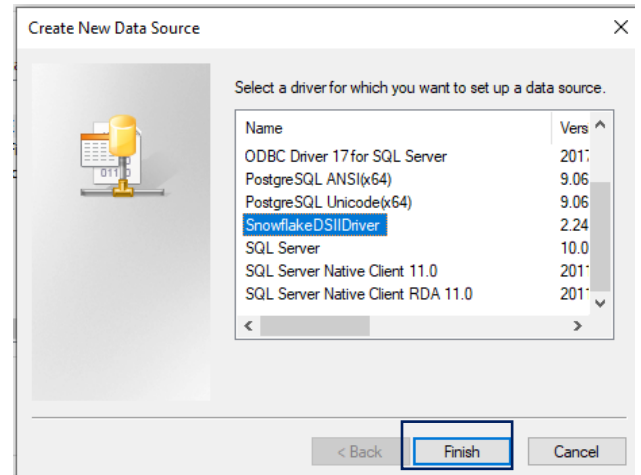
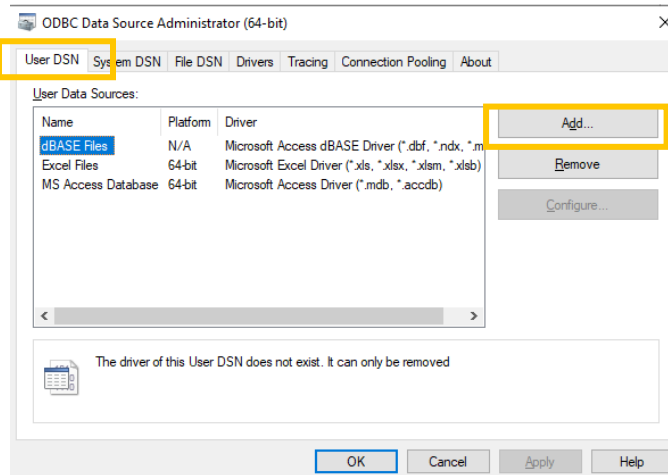
- 1) Copy the attached txt file (cacert.txt) to your computer at location - C:\Program Files\Snowflake ODBC Driver\etc



- 2) Move the existing cacert pem file to another location as backup
-
- 3) Rename the cacert.txt file to cacert.pem

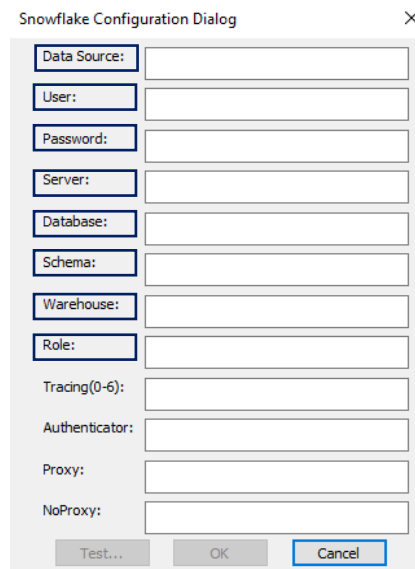
B. Cisco AnyConnect (VPN) Users – no additional configuration is needed; proceed to C.

C. In the Windows Search Box, search for ODBC and select the **ODBC Data Sources** application corresponding to the driver you downloaded above (64-bit).D. On the **User DSN** tab, select **Add** and scroll down to **SnowflakeDSIIDriver**.



E. Configure Snowflake ODBC – configuration will depend on program association.

In the **Snowflake Configuration Dialog** box, fill out the following fields to configure the ODBC Driver into a Data Source Name (DSN). Try using the **Test** button before pressing **OK** to ensure the connection is working properly:



Data Source (DSN): This field is unique to you and you may choose to name it how you wish. This name will be referenced when connecting to tools mentioned in Section 2.

User: This is the username provided to you when your Snowflake access was provisioned. Please reach out to DL_DSHP_SHARP_IT_Ops_Support@hhsc.state.tx.us for any assistance with Snowflake Reader Account

Password: This is your Snowflake Reader Account password

Server: The Snowflake Reader Account URL provided with your credentials

Database*:

Schema*:

Warehouse*:

Role*:

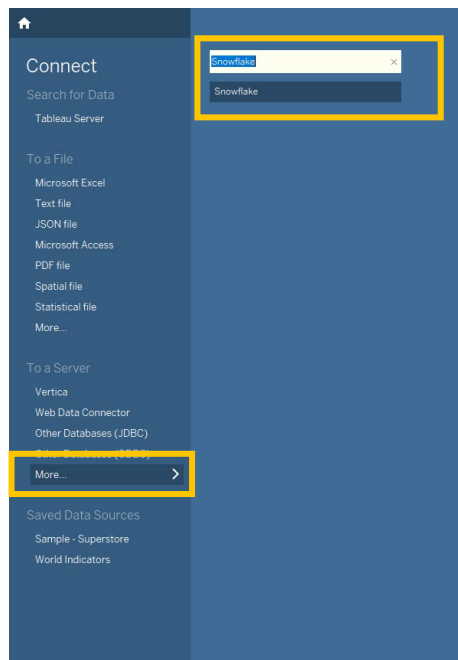
Note: * These details can be found within Snowflake GUI (logged in with your Snowflake Account) on the Worksheets tab in the top right-hand corner and should be provided in the email with your credentials. If you have access to multiple databases/roles, please be sure you use the appropriate role and details to connect to the database you are trying to access.

Section 4: Connecting to Applications

To Use Snowflake through a Connection - the user must connect to the Snowflake application using the DSHS-CISCO AnyConnect VPN. This is true for both ODBC and Native Connectors.

A. Connecting to Tableau Desktop with Native Connector

1. Download the ODBC Driver ([see Section 2](#))
 - a. No DSN configuration is needed
2. Open Tableau and click Connect to data.
3. Select More under To a Server and search for Snowflake.



4. Input your Snowflake credentials and press **Sign In**.

Server: The Snowflake Reader Account URL provided with your credentials

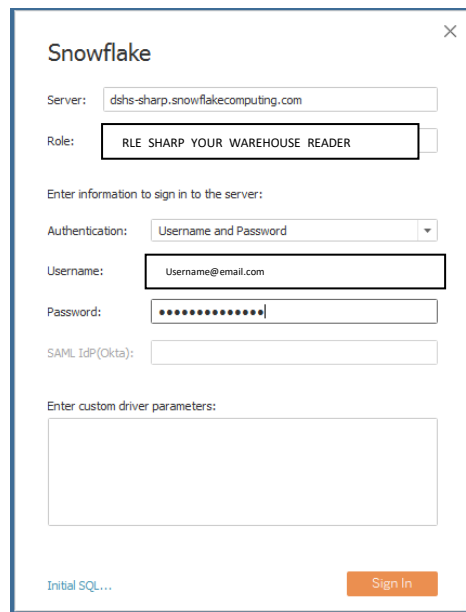
Role*:

Authentication: "Username and Password"

Username*: Your Snowflake Reader Account username

Password*: Your Snowflake Reader Account password

Note: * indicates information that will be sent to you from a DSHS Tool Administrator once you have been provisioned Snowflake access. If you experience any issues, please email DL_DSHS_SHARP_IT_Ops_Support@hhsc.state.tx.us.



The screenshot shows a 'Snowflake' sign-in dialog box with the following fields and options:

- Server:** dshs-sharp.snowflakecomputing.com
- Role:** RLE SHARP YOUR WAREHOUSE READER
- Authentication:** Username and Password (dropdown menu)
- Username:** Username@email.com
- Password:** [Masked with dots]
- SAML IdP(Okta):** [Empty field]
- Enter custom driver parameters:** [Empty text area]
- Initial SQL...** [Text input field]
- Sign In** [Orange button]

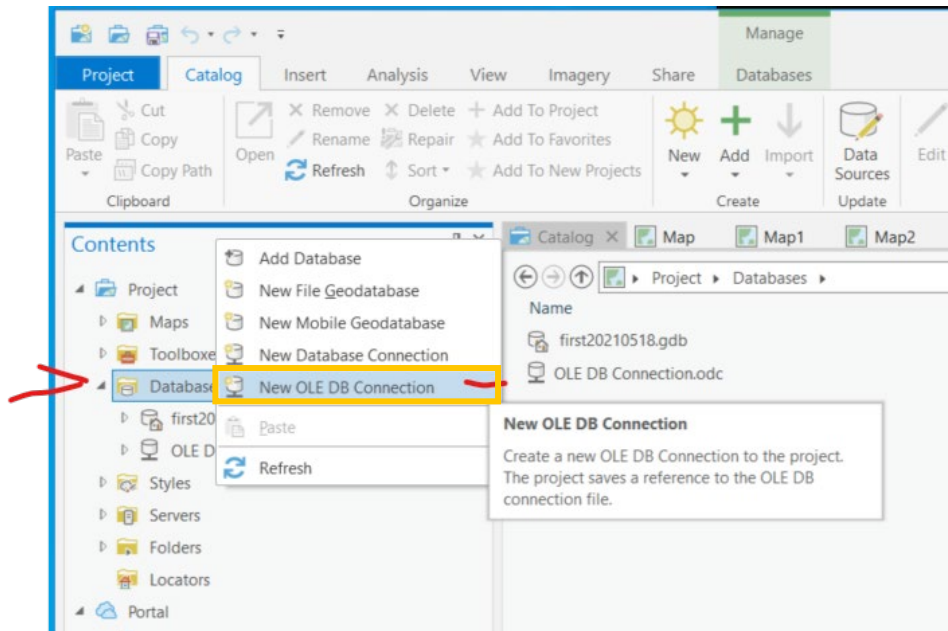
B. Connecting to ArcGIS Pro with ODBC

Snowflake data is available to load and use in ArcGIS Pro. It is best to connect to Snowflake data using ArcGIS Pro due to its modern design and, specifically, its 64-bit software architecture.

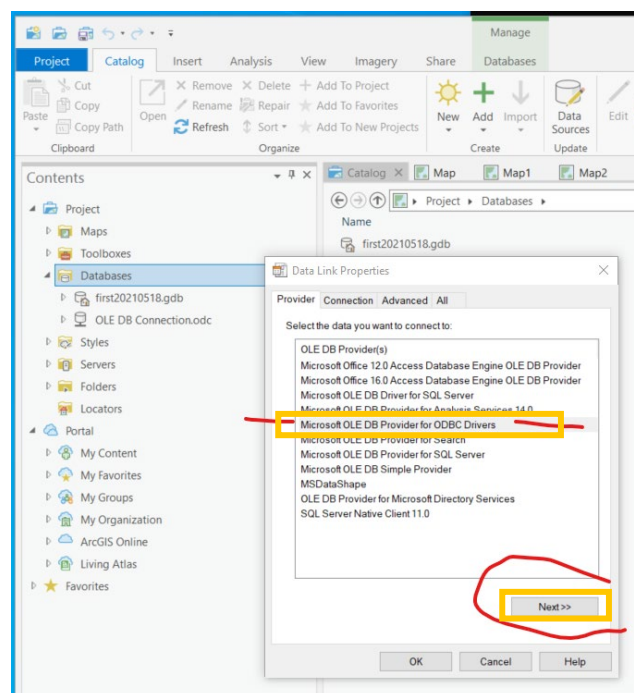
Contact DL_DSHS_SHARP_IT_Ops_Support@hhsc.state.tx.us for help or questions.

1. Open ArcGIS Pro and open its Catalog

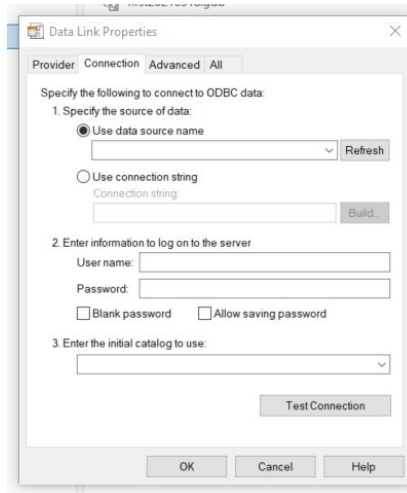
- Right-click Databases on the left side of the Catalog screen and select **New OLE DB Connection**.



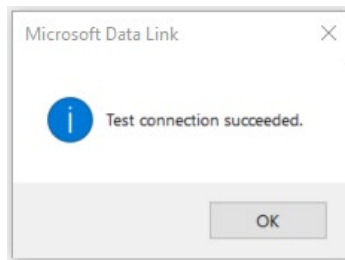
- On the new Pop-Up, choose **Microsoft OLE DB Provider for ODBC Drivers** and click **Next**
- On the pop-up screen, use the drop-down menu under **Use data source name** and select the name of the new Snowflake ODBC driver (DSN Name created in **Configuring ODBC Driver** section).



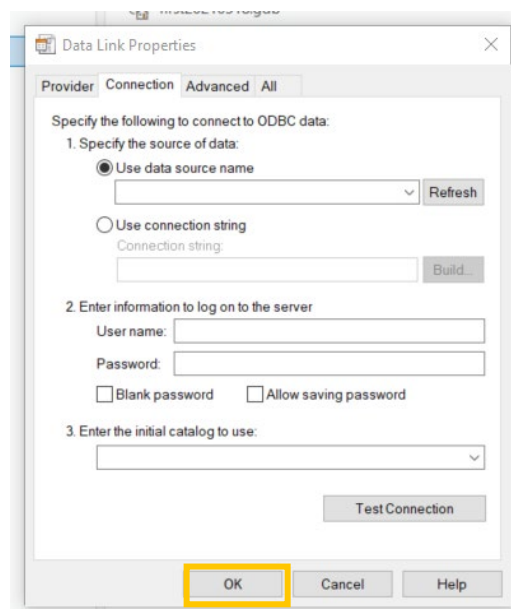
5. Insert your username and password for Snowflake, then click **Test Connection**.



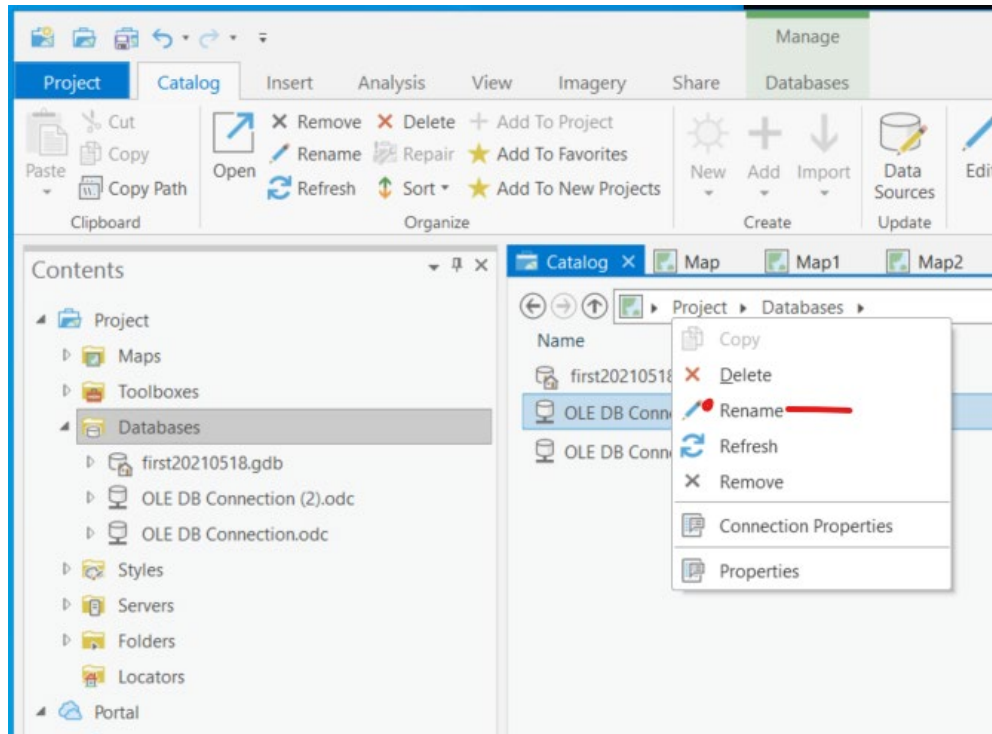
6. A pop-up will show Connection Successful. Click **Ok** to continue



7. Click OK on the Data Link Pop-Up



- Right-click the new name in the Catalog Databases section. Choose the Rename and change the name to something meaningful.



- Open the Snowflake connection, and choose the necessary data.

C. Connecting to SAS 9.4 (Desktop) with ODBC

- Using the DSN in Section 3, run the following SAS code to test the connection in SAS, then look for the newly created object "LIBNAME" to confirm a successful connection.

```
libname mydblib odbc
noprompt="uid=YOUR_USER_ID;pwd=YOUR
PASSWORD;dsn= DSN_NAME;"
stringdates=yes;
```

D. Connecting to SAS Viya with ODBC

- Write the libname statement using your ODBC Data Source Name (DSN) as assigned to your database and the associated username, password, and desired schema.

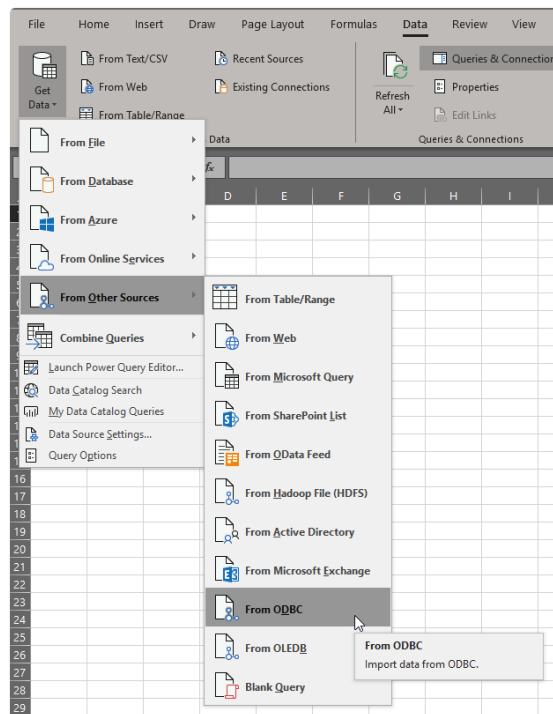
- After running the SAS code to test the connection, look for the newly created object "LIBNAME" to confirm a successful connection.

```
libname test odbc

dsn=DSN NAME CREATED IN SECTION 3 user=YOUR USER
ID password=YOUR PASSWORD schema= SCHEMA NAME;
```

E. Connecting to Excel with ODBC

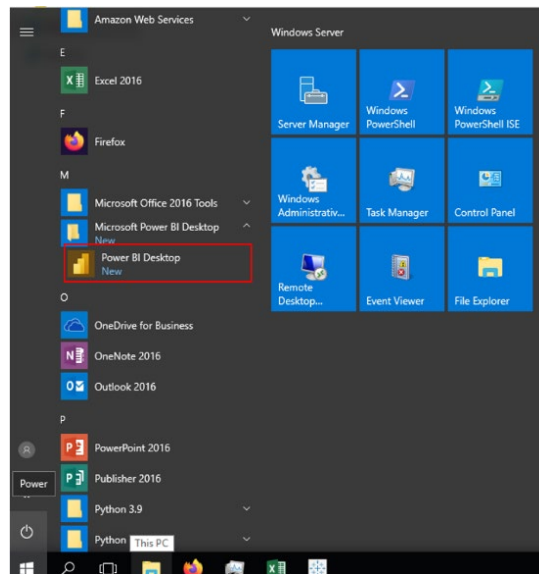
- Open an Excel Workbook and select the **Data** tab.
- Select the drop-down for **Get Data**.
- Select the option for **From Other Sources**.
- Select the option **From ODBC**.



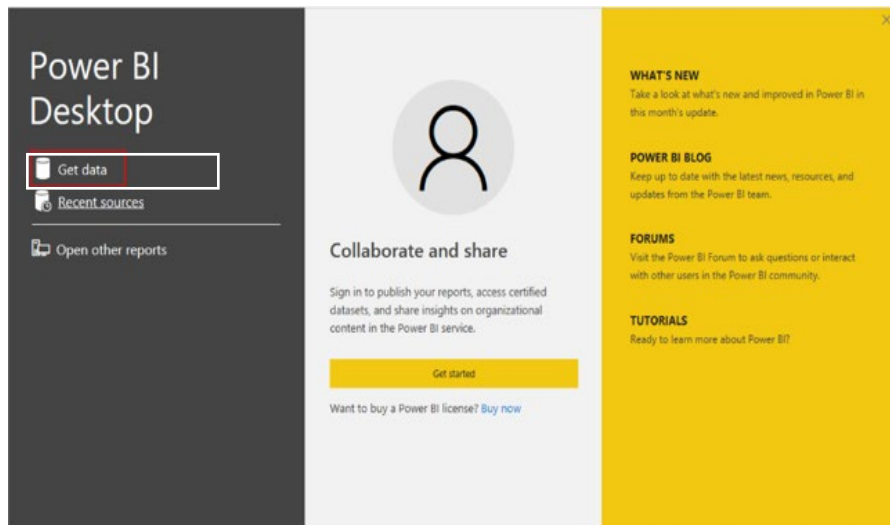
- Select the DSN (Data Source Name) you configured in Section 1.
- Select the database and table you want to query.

F. Connecting to Microsoft Power BI with Native Connector

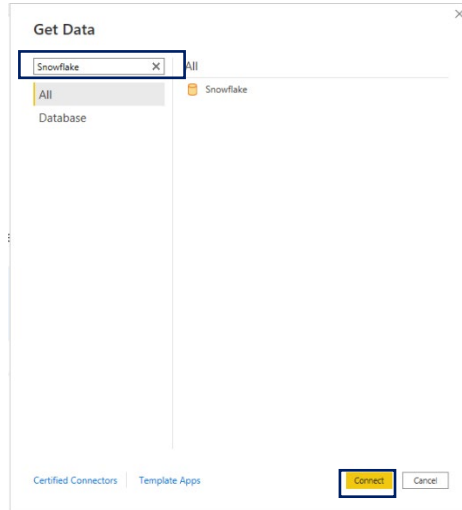
- Click **START**, navigate to the Microsoft Power BI Desktop/Pro folder, and select the version of Power BI you are using.



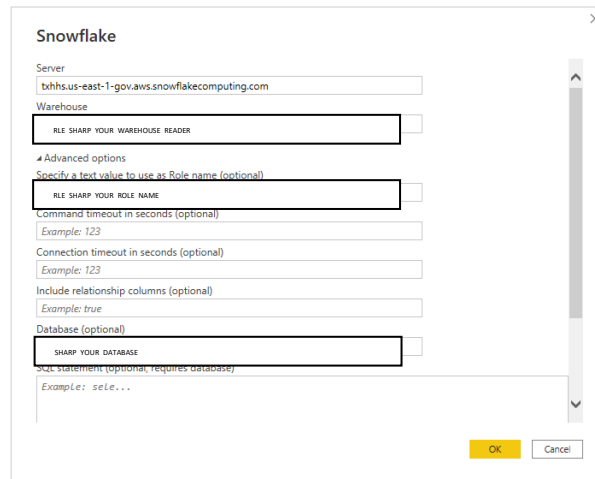
2. Click on the **Get Started** prompt, followed by the option to **Get data**.



- When prompted, search or find the **Snowflake** connection and click on **Connect**.



- Configure the Snowflake connection details when prompted. Please use the provided figure as an example and populate the data unique to your setup. You will also be prompted to sign in with your Snowflake login credentials.



- To confirm a successful connection, navigate through the **Navigator**, choose a data table you wish to work with, and click **Load**. If no error messages appear, you have successfully connected to your data in Snowflake.

Navigator

Display Options

- btchs.us-east-1-gov.aws.snowflakecomputi...
- DEMO_DB
- SHARP_CHS_DEV_DB [2]
- CHS_HPR_HPRC_DATA [56]
 - TEMP_VW_TEST
 - V_HPRC_AGE_DISTRIBUTION_BY_GE...
 - V_HPRC_AGE_DISTRIBUTION_BY_RA...
 - V_HPRC_COUNTRY_OF_MEDICAL_S...
 - V_HPRC_FACT_SHEETS_ALL_DATA
 - V_HPRC_GEOGRAPHIC_DISTRIBUTI...
 - V_HPRC_PRACTICE_HOURS
 - V_HPRC_PRACTICE_SETTING
 - V_HPRC_PRACTICE_SPECIALTY
 - V_HPRC_RACE_ETHNICITY_BY_PROF...
 - V_HPRC_STATE_OF_TRAINING
 - V_HPRC_SUPPLY_TABLES
 - T_CNTY_DESIGNATION_TEMP
 - T_HPR_HPRC_CHIROPRACTIC_LB_T...
 - T_HPR_HPRC_LB_AGING_DISBLTY_C...
 - T_HPR_HPRC_LB_AGING_DISBLTY_...

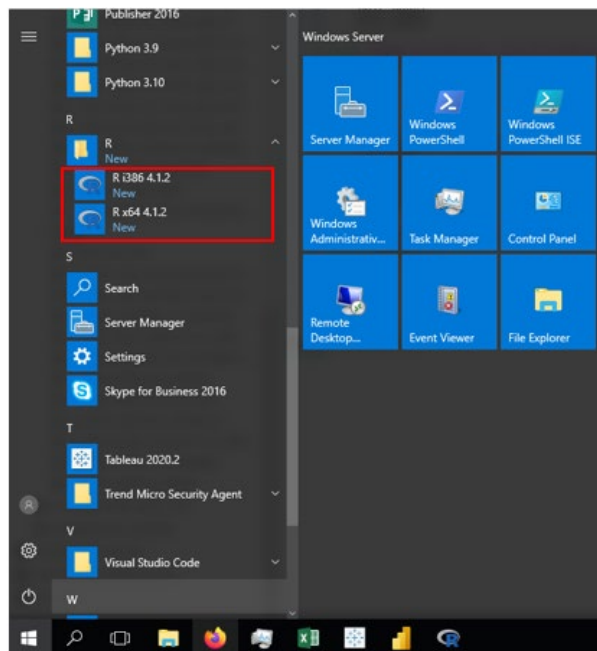
V_HPRC_AGE_DISTRIBUTION_BY_GENDER

AGE_CAT	YEAR	PROFESSION	MALE	FEMALE
51-55	2020	Dental Assistant		173
55-60	2020	Dental Assistant		152
>65	2020	Dental Assistant		65
61-65	2020	Dental Assistant		61
null	2020	Dental Assistant		15
<=25	2020	Dental Hygienist		14
26-30	2020	Dental Hygienist		79
31-35	2020	Dental Hygienist		119
36-40	2020	Dental Hygienist		89
41-45	2020	Dental Hygienist		64
46-50	2020	Dental Hygienist		70
51-55	2020	Dental Hygienist		41
55-60	2020	Dental Hygienist		34
61-65	2020	Dental Hygienist		32
>65	2020	Dental Hygienist		35
null	2020	Dental Hygienist		1
<=25	2020	Dentist		17
26-30	2020	Dentist		573
31-35	2020	Dentist		1718
36-40	2020	Dentist		2134
41-45	2020	Dentist		2014
46-50	2020	Dentist		1690
51-55	2020	Dentist		1298

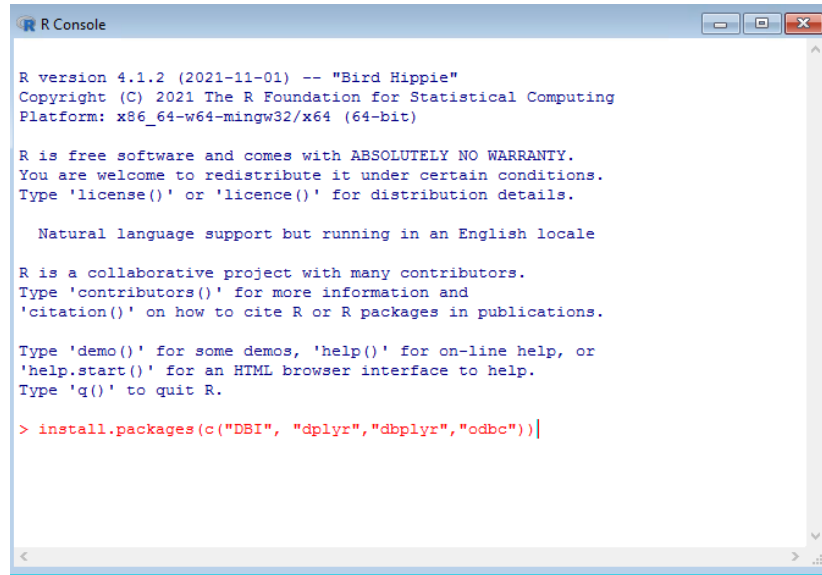
Select Related Tables Load Transform Data Cancel

G. Connecting to R with ODBC

1. Click **START**, navigate to the version of R you are using, and run the application as an administrator.



- Run the below command to install ODBC and other necessary packages to establish a Snowflake connection.



```
R Console
R version 4.1.2 (2021-11-01) -- "Bird Hippie"
Copyright (C) 2021 The R Foundation for Statistical Computing
Platform: x86_64-w64-mingw32/x64 (64-bit)

R is free software and comes with ABSOLUTELY NO WARRANTY.
You are welcome to redistribute it under certain conditions.
Type 'license()' or 'licence()' for distribution details.

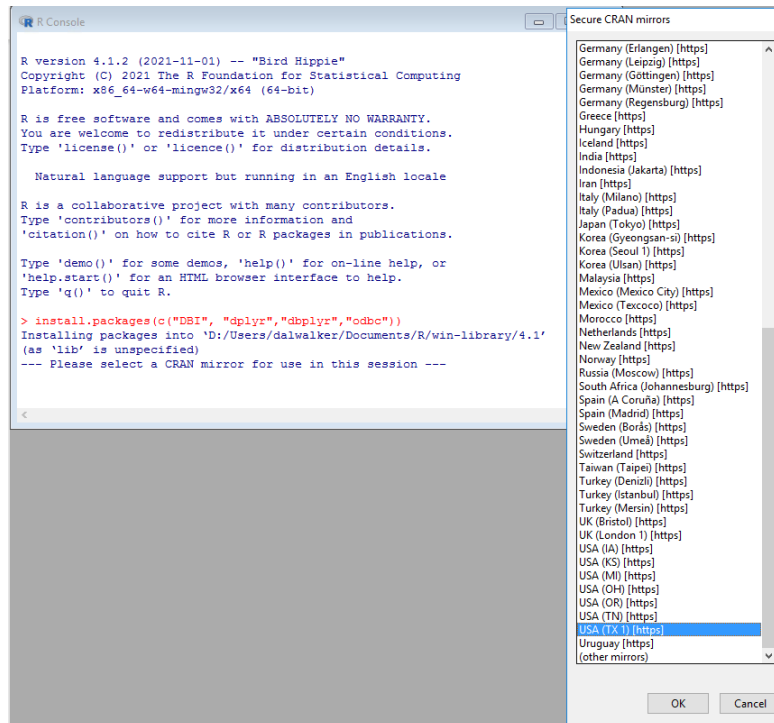
Natural language support but running in an English locale

R is a collaborative project with many contributors.
Type 'contributors()' for more information and
'citation()' on how to cite R or R packages in publications.

Type 'demo()' for some demos, 'help()' for on-line help, or
'help.start()' for an HTML browser interface to help.
Type 'q()' to quit R.

> install.packages(c("DBI", "dplyr", "dbplyr", "odbc"))
```

- When prompted, select the CRAN mirror, **USA (TX 1) [https]** and click **OK** (as shown below in the diagram)



4. Test the Snowflake connection by updating the details highlighted in yellow with your credentials, then copying and pasting the code into the console.

```
library(DBI)
library(dplyr)
library(dbplyr)
library(odbc)

myconn <- DBI::dbConnect(odbc::odbc(), dsn="DSN
CREATED IN SECTION 3", uid="SNOWFLAKE
USERNAME", pwd="SNOWFLAKE PASSWORD")
```

H. Connecting to Python with Snowflake Connector

Python allows you to connect to Snowflake via a Snowflake Connector or through SQL Alchemy. You have the option to choose between either option.

1. Install the Snowflake Connector library using the following command.

```
pip install snowflake-connector-python
```

2. Substitute all highlighted areas with your credentials (reach out to sharp-comm@dshs.texas.gov for any assistance needed) and execute the following code to connect to Snowflake and read data from a table.

```
import pandas as pd
import snowflake.connector as snow

conn = snow.connect(user = SNOWFLAKE USERNAME,
                    password = SNOWFLAKE PASSWORD,
                    account = "SNOWFLAKE SERVER LINK",
                    database = "SNOWFLAKE DATABASE NAME",
                    schema = "SNOWFLAKE SCHEMA NAME",
                    warehouse = "SNOWFLAKE WAREHOUSE NAME")

cur=conn.cursor()
sql="USE ROLE SNOWFLAKE ROLE"
cur.execute(sql)
sql1="USE WAREHOUSE SNOWFLAKE WAREHOUSE NAME"
cur.execute(sql1)
sql2="USE DATABASE SNOWFLAKE DATABASE NAME"
cur.execute(sql2)
sql3="USE SCHEMA SNOWFLAKE SCHEMA"
cur.execute(sql3)
sql4="SELECT * FROM SNOWFLAKE TABLE NAME LIMIT 5"
cur.execute(sql4)

#Closing the connection
conn.close()
```

I. Connecting to Python with SQL Alchemy

1. Install the SQL Alchemy library using the following command.

```
pip install snowflake-sqlalchemy
```

```
from snowflake.sqlalchemy import URL
from sqlalchemy import create_engine
engine = create_engine(URL(
    account = "SNOWFLAKE SERVER LINK"
    user = "SNOWFLAKE USERNAME"
    password = "SNOWFLAKE PASSWORD"
    database = "SNOWFLAKE DATABASE NAME"
    schema = "SNOWFLAKE SCHEMA NAME"
    warehouse = "SNOWFLAKE WAREHOUSE NAME"
    role = "SNOWFLAKE ROLE NAME"))

#Creating a snowflake connection using the parameters above
connection = engine.connect()

try:
    connection.execute(SQL CODE) - allows you to read data
finally:
    connection.close() - closing the connection
    engine.dispose() - closing the Snowflake engine created
```

2. To validate the connection, substitute all highlighted areas with your credentials and run the following code.

Section 5: Additional Support

A. Help Desk Ticket Template to DSHS IT Department: ODBC Installation Request

If you need assistance downloading and installing the Snowflake ODBC Driver to your machine, please feel free to use this template below when creating a help desk ticket for your IT department. Reminder, if you do not have administrative privileges or the download fails, you will need to contact your IT Department.

IT Help Desk: <https://hhsconnection.hhs.texas.gov/it/help-desk>

Ticket Body:

Hi,

I am requesting assistance with downloading and installing Snowflake's ODBC Driver. This ODBC Driver Install is a prerequisite to accessing the data available in Snowflake via our desired tools. Here is a link for reference: [Installing and Configuring the ODBC Driver for Windows — Snowflake Documentation](#).

Thank you!

B. Help Desk Ticket Template to DSHS IT Department: 443 Error

If you receive a "443 Error" while configuring the Snowflake ODBC Driver to your machine, please follow [Section 3. A: 1-3](#) on saving the cacert file. If you still face the error after saving the cacert file, you may need the assistance of the IT Department to send an updated cacert file.

IT Help Desk: <https://hhsconnection.hhs.texas.gov/it/help-desk>

Email Body:

Hi,

I am requesting assistance with downloading and installing Snowflake's ODBC Driver. While configuring the driver, I received a 443 error. After saving the cacert file to my machine, I still received the 443 error. Here is a copy of the cacert file for reference:



Thank you!

C. Additional Documentation

1. [Installing and Configuring the ODBC Driver for Windows — Snowflake Documentation](#)

- a. Documentation from the Snowflake website on downloading, installing, and configuring your ODBC driver.
2. [Connecting to Snowflake — Snowflake Documentation](#)
 - a. Documentation on how to connect 3rd party tools and applications to Snowflake.