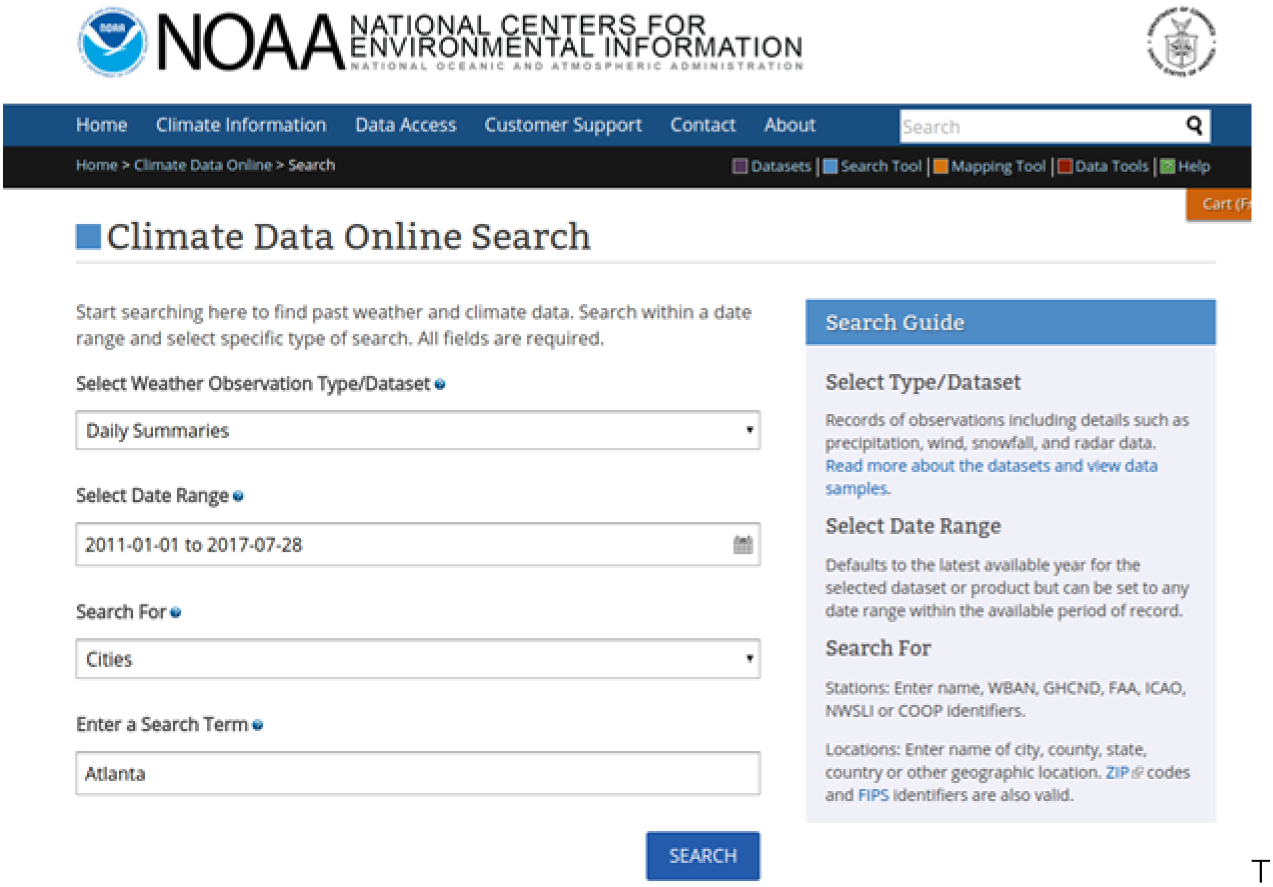
APACHE HIVE BEELINE CLIENT, IMPORT CSV FILE INTO HIVE

Beeline has replaced the Hive CLI in what Hive was formally called HiveServer1. Now Hive is called HiveServer2 and the new, improved CLI is Beeline.

Apache Hive says, “HiveServer2 (introduced in Hive 0.11) has its own CLI called Beeline. HiveCLI is now deprecated in favor of Beeline, as it lacks the multi-user, security, and other capabilities of HiveServer2.”

Here we are going to show how to start the Hive HiverServer2 and load a CSV file into it. The syntax is much different from HiveServer1, which we wrote about here.

The data we load are weather data downloaded from here https://www.ncdc.noaa.gov/cdo-web/results. There is much data there, so in the screen shown below we picked “daily summaries” for Atlanta, Georgia. Pick just one year, 2017.


NOAA NATIONAL CENTERS FOR ENVIRONMENTAL INFORMATION
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
Home
Climate Information
Data Access
Customer Support
Contact
About
Search
Home > Climate Data Online > Search
Datasets | Search Tool | Mapping Tool | Data Tools | Help
Cart (F
SEARCH

Climate Data Online Search

Start searching here to find past weather and climate data. Search within a date range and select specific type of search. All fields are required.

Select Weather Observation Type/Dataset: Daily Summaries

Select Date Range: 2011-01-01 to 2017-07-28

Search For: Cities

Enter a Search Term: Atlanta

Search Guide

Select Type/Dataset

Records of observations including details such as precipitation, wind, snowfall, and radar data. Read more about the datasets and view data samples.

Select Date Range

Defaults to the latest available year for the selected dataset or product but can be set to any date range within the available period of record.

Search For

Stations: Enter name, WBAN, GHCND, FAA, ICAO, NWSLI or COOP identifiers.

Locations: Enter name of city, county, state, country or other geographic location. ZIP codes and FIPS identifiers are also valid.

The data looks like this after the header has been removed. Use a text editor to do that,

GHCND:US1GADK0001,TUCKER 1.3 ENE GA US,20170101,0.30,-9999,-9999
GHCND:US1GADK0001,TUCKER 1.3 ENE GA US,20170102,0.76,-9999,-9999

Now install Hive using the instructions from the Apache web site. And then set $HIVE_HOME. Start Hadoop using start_dfs.sh for a local installation or **start_yarn.sh** and then start_dfs.sh for a cluster installation.

How Beeline differs from Hive CLI

One big difference you will notice from HiveServer1 to HiveServer2 is you do not need have to manually create schemas in MySQL or Derby. Instead, with HiveServer2, install MySQL then run this command to create the schema:

```
$HIVE_HOME/bin/schematool -dbType mysql -initSchema
```

Start Hive Server

Then start the Hive server:

```
sudo nohup $HIVE_HOME/bin/hiveserver2&
```

Beeline Hive Shell

Here is how to open the Beeline Hive shell>

```
$HIVE_HOME/bin/beeline -u jdbc:hive2://localhost:10000
```

Now, the user root will get this error when they run commands:

> User: root is not allowed to impersonate anonymous

So when you set up the config files give root permission to do that, if you want to login as user root.

Notice below that we specifically give the root user the rights to execute Hive commands. You can switch the name **root** to your userid or read the instructions to get more details on the other options.

```
cat $HIVE_HOME/conf/core-site.xml
<configuration>
<property>
<name>hive.server2.enable.doAs</name>
<value>true</value>
</property>
<property>
<name>hadoop.proxyuser.root.groups</name>
<value>*</value>
</property>
<property>
<name>hadoop.proxyuser.root.hosts</name>
<value>*</value>
</property>
</configuration>
```

This is the **JDBC URL**. Because this is a standard it means you can connect to Hive from Java and SQL clients, like Squirrel.

```
cat $HIVE_HOME/conf/hive-site.xml
<configuration>
<property>
<name>javax.jdo.option.ConnectionURL</name>
<value>jdbc:mysql://localhost/metastore?createDatabaseIfNotExist=true</value>
<description>metadata is stored in a MySQL server</description>
</property>
<property>
<name>javax.jdo.option.ConnectionDriverName</name>
<value>com.mysql.jdbc.Driver</value>
<description>MySQL JDBC driver class</description>
</property>
<property>
<name>javax.jdo.option.ConnectionUserName</name>
<value>hiveuser</value>
<description>user name for connecting to mysql server</description>
</property>
<property>
<name>javax.jdo.option.ConnectionPassword</name>
<value>password</value>
<description>password for connecting to mysql server</description>
</property>
```

```
</configuration>
```

Now create the weather table:

```
CREATE table weather(
STATION STRING,
STATION_NAME STRING,
WDATE STRING,
PRCP FLOAT,
WIND INT,
SNOW INT
)
ROW FORMAT DELIMITED FIELDS TERMINATED BY ','
LINES TERMINATED BY '\n'
STORED AS TEXTFILE;
```

Then load the data from the local file system.

```
LOAD DATA INPATH '/root/Documents/1031764.csv' OVERWRITE INTO TABLE weather;
```

Now show that there is some data in it

```
select count(*) from weather;
```

_co
4235
1 row selected (1.914 seconds)

Using SQL With Hive

The SQL language Reference manual for Hive is here. It will be useful to follow along.

Let's see what is the rainiest day on the month for any month of the year.

First lets show the schema of our table:

describe weather;

col_name	data_type	comment
station	string	
station_name	string	
wdate	string	
prcp	float	
wind	int	
snow	int	

Now, we cannot group on columns on which we have run functions. And we cannot create views. That means we cannot divide this into simpler, concrete steps. All we can do is make nested SQL statements. In this case we do three:

1. Turn the date field into day of month.
2. Using that query total rainfall per day of month.
3. Finally print the results sorted by amount of rain per day of month.

Here is the complete query.

```
Select b.rain, b.day from
(select sum(prcp) as rain, a.day as day from
(select prcp, dayofmonth(to_date(from_unixtime(unix_timestamp(wdate,
"yyyymmddd")))) as day from weather where prcp > 0) a
Group by a.day) b
Order by b.rain;
```

Looking at the innermost query first, turn unix time into a date object using to_date(). Then use dayofmonth() to get day or month.

```
select prcp,
dayofmonth(to_date(from_unixtime(unix_timestamp(wdate, "yyyymmddd")))) as day
from weather where prcp > 0
```

That result lacks the sum of precipitation. After all we cannot sum the precipitation by day of month until we have grouped the data into day of month. And remember we said we cannot order by calculated values. We so we need another step for that.

This next SQL shows the rainfall by day. So we need one step more after this to order it by total rainfall and not day.

```
select sum(prcp) as rain, a.day as day from
(select prcp, dayofmonth(to_date(from_unixtime(unix_timestamp(wdate,
"yyyymmddd")))) as day from weather where prcp > 0) a
Group by a.day
```

Finally, running the first query about Looks like the 6th day of the month is the rainiest.

b.rain	b.day
0.9000000040978193	27
2.240000018849969	17
3.7899999916553497	29
5.250000001862645	9
5.830000016838312	13
5.970000043511391	11
7.929999986663461	25
9.790000105276704	16
10.079999938607216	10
10.439999951049685	14
10.459999982267618	18
11.820000018924475	26

b.rain	b.day
14.159999972209334	28
14.389999927952886	12
15.17000013589859	19
18.720000019297004	15
20.27999988757074	1
20.329999884590507	4
21.089999973773956	31
21.169999765232205	7
26.680000007152557	20
35.399999901652336	30
35.699999986216426	8
36.230000007897615	2
37.28000004403293	24
44.0399998370558	23
47.20999996364117	3
63.980000307783484	5
77.87000086344779	21
82.32000004313886	22
82.78000020980835	6