



Department of Computer Science  
2018/2019

## **UK CLIMATE ANALYSIS**

### **User Guide Manual**

In Collaboration With



**Hartree Centre**

Science & Technology Facilities Council

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To get started with the project, a user must follow the following instructions :

1. A user must have **access to Hartree Centre Safe Account**. Unless you are granted with the credentials from Hartree, you cannot proceed.
2. The next step would be to **follow the user guide provided by Hartree (attached in the folder)**. It is necessary to set up private keys and public keys on user's local machine. Once done, upload the public key to Hartree's SAFE account.

### 3. Update SSH configuration file :

Go to file directory "C:\Users\\*\ssh\" and open "config" file.

Name	Date modified	Type
 config	02/05/2019 12:11	File
 id_dsa	14/02/2019 13:42	File
 id_dsa.pub	11/03/2019 22:48	Microsoft
 known_hosts	11/03/2019 14:49	File

Add below code and replace "%USERNAME%" with Hartree Username.

```
Host login1
  Hostname login1.dawson.hartree.stfc.ac.uk

Host bicluster1
  User %USERNAME%
  Hostname bdb209
  ProxyCommand ssh -A %r@login1 -W %h:%p
  # Jupyterlab
  LocalForward 8888 localhost:8888
  LocalForward 8889 localhost:8889
  LocalForward 8890 localhost:8890
  LocalForward 8891 localhost:8891
  LocalForward 8892 localhost:8892
  LocalForward 8893 localhost:8893
  LocalForward 8894 localhost:8894
  LocalForward 8895 localhost:8895
  LocalForward 8896 localhost:8896
  LocalForward 8897 localhost:8897
  LocalForward 8898 localhost:8898
```

#### 4. Accessing Hartree HPC machine :

Open Command Line Prompt and run below command. If your ssh key is set up correctly you will not be asked for any password. The prompt should indicate you are logged into bdb209.

```
ssh bicluster1
```

Run the following once - it will write some stuff to your .bashrc to configure python.

```
/usr/local/bin/set_anaconda.sh
```

Copy the following into your .bashrc to set your Java home directory, to configure spark, and to configure pyspark to use Jupyter Lab.

```
export JAVA_HOME=/usr/jdk64/jdk1.8.0_112
export HDP_VERSION=2.6.4.0-91
export SPARK_MAJOR_VERSION=2
export PYSPARK_DRIVER_PYTHON=jupyter
export PYSPARK_DRIVER_PYTHON_OPTS=lab
```

Then source the .bashrc file. This only needs to be done once. On subsequent logins this will run automatically.

```
source .bashrc
```

#### 5. How to open PySpark platform ?

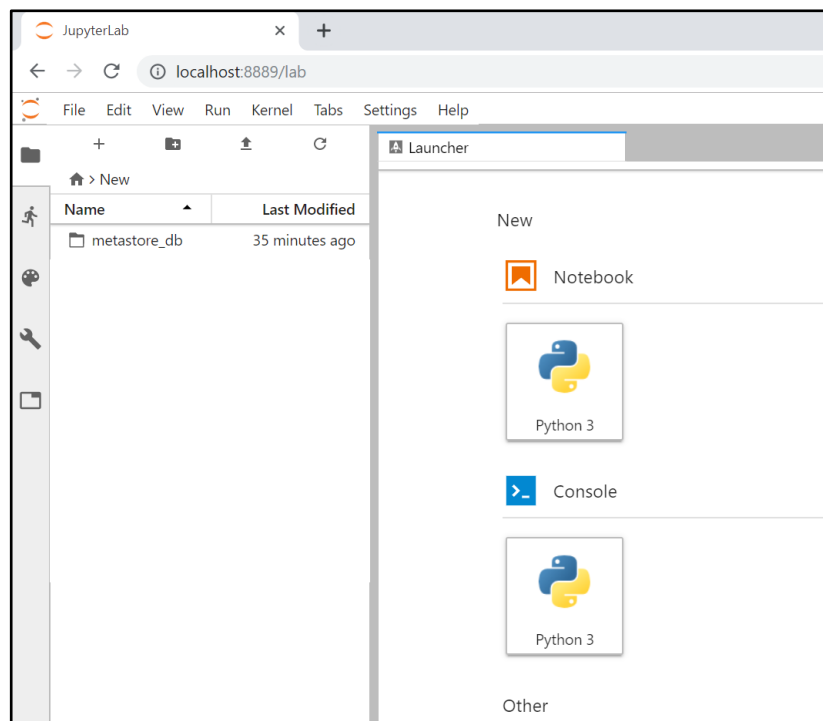
Open PySpark platform and open the highlighted link in any browser

```
pyspark
```

```
axa19-kkr16@bdb209:~$ pyspark
SPARK_MAJOR_VERSION is set to 2, using Spark2
[I 15:32:44.976 LabApp] Writing notebook server cookie secret to /run/user/7010/jupyter/notebook_cookie_secret
[I 15:32:45.132 LabApp] The port 8888 is already in use, trying another port.
[I 15:32:45.140 LabApp] JupyterLab extension loaded from /opt/anaconda3/lib/python3.7/site-packages/jupyterlab
[I 15:32:45.140 LabApp] JupyterLab application directory is /opt/anaconda3/share/jupyter/lab
[W 15:32:45.142 LabApp] JupyterLab server extension not enabled, manually loading...
[I 15:32:45.144 LabApp] JupyterLab extension loaded from /opt/anaconda3/lib/python3.7/site-packages/jupyterlab
[I 15:32:45.144 LabApp] JupyterLab application directory is /opt/anaconda3/share/jupyter/lab
[I 15:32:45.145 LabApp] Serving notebooks from local directory: /bdusers/HCP053/kkr16/axa19-kkr16
[I 15:32:45.145 LabApp] The Jupyter Notebook is running at:
[I 15:32:45.145 LabApp] http://localhost:8889/?token=53ea46824fae6f200d6ec897f25f54479836c0e174a8fbd6
[I 15:32:45.145 LabApp] Use Control-C to stop this server and shut down all kernels (twice to skip confirmation).
[W 15:32:45.148 LabApp] No web browser found: could not locate runnable browser.
[C 15:32:45.148 LabApp]

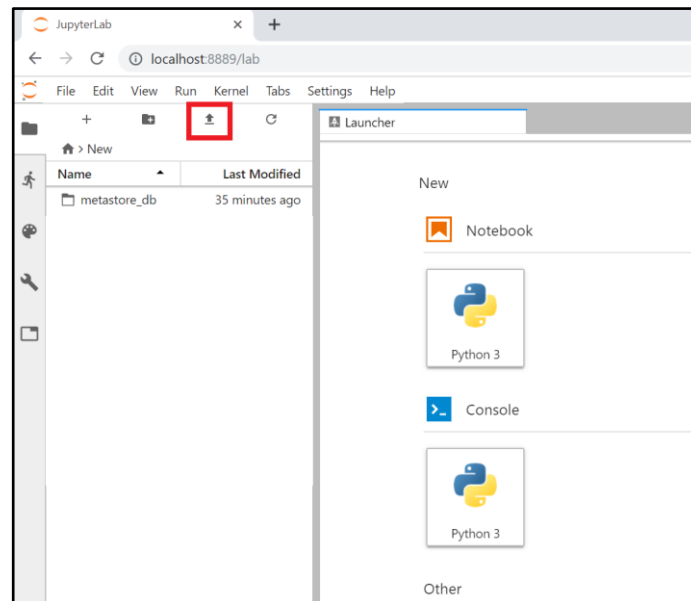
To access the notebook, open this file in a browser:
    file:///run/user/7010/jupyter/nbserver-20349-open.html
Or copy and paste one of these URLs:
http://localhost:8889/?token=53ea46824fae6f200d6ec897f25f54479836c0e174a8fbd6
```

Copy the highlighted link and paste it any browser

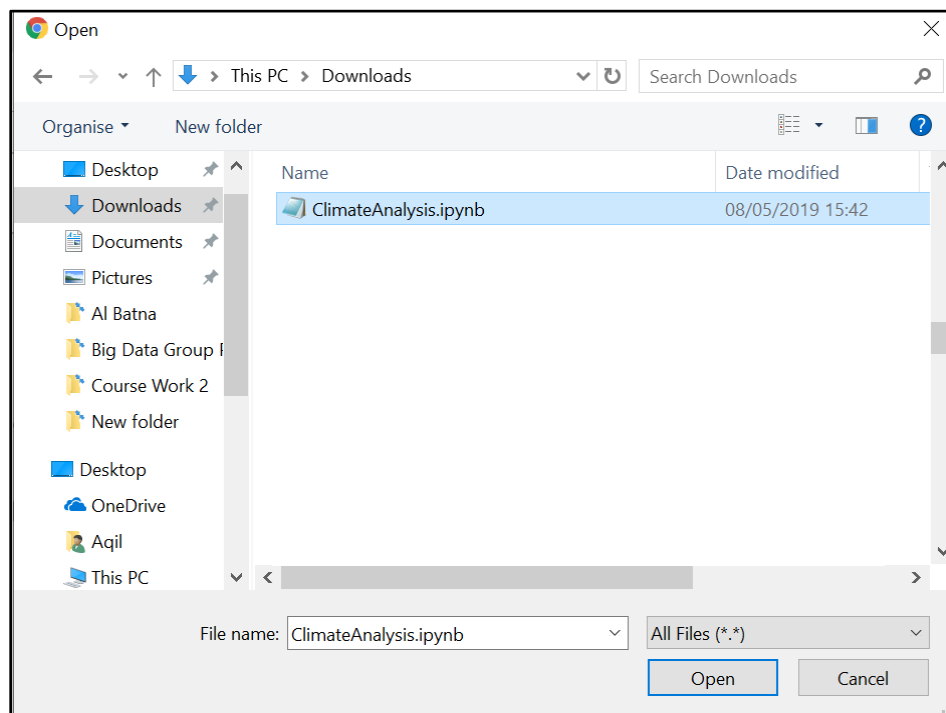


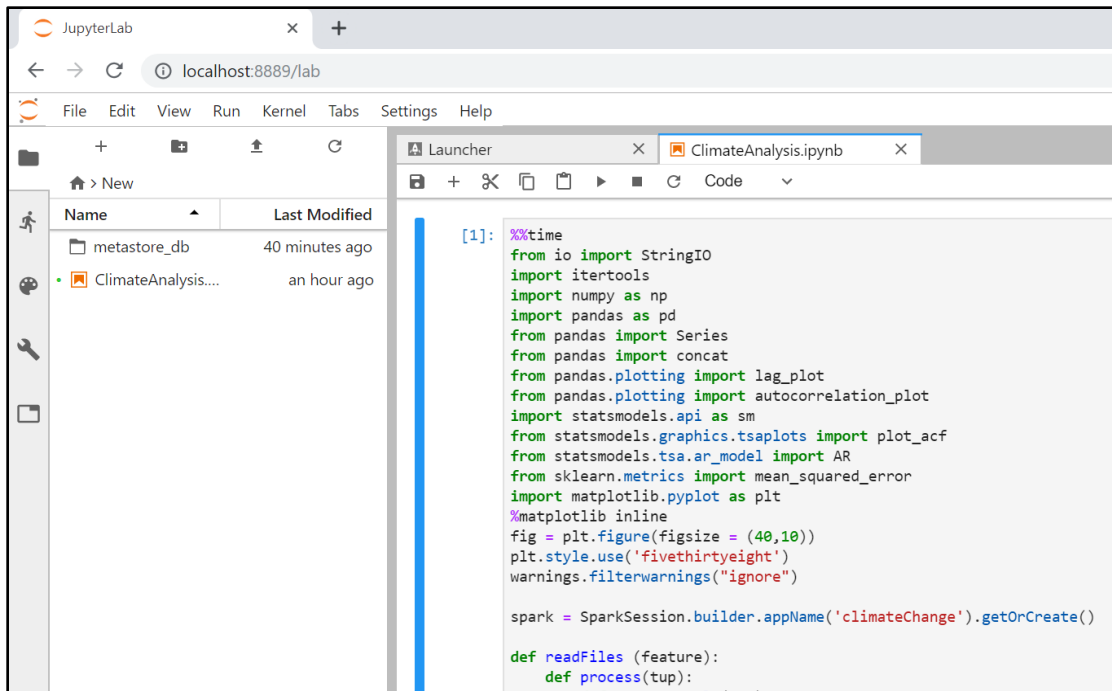
## 6. Upload the “ClimateAnalysis” Jupyter Notebook

Click on Upload Button.



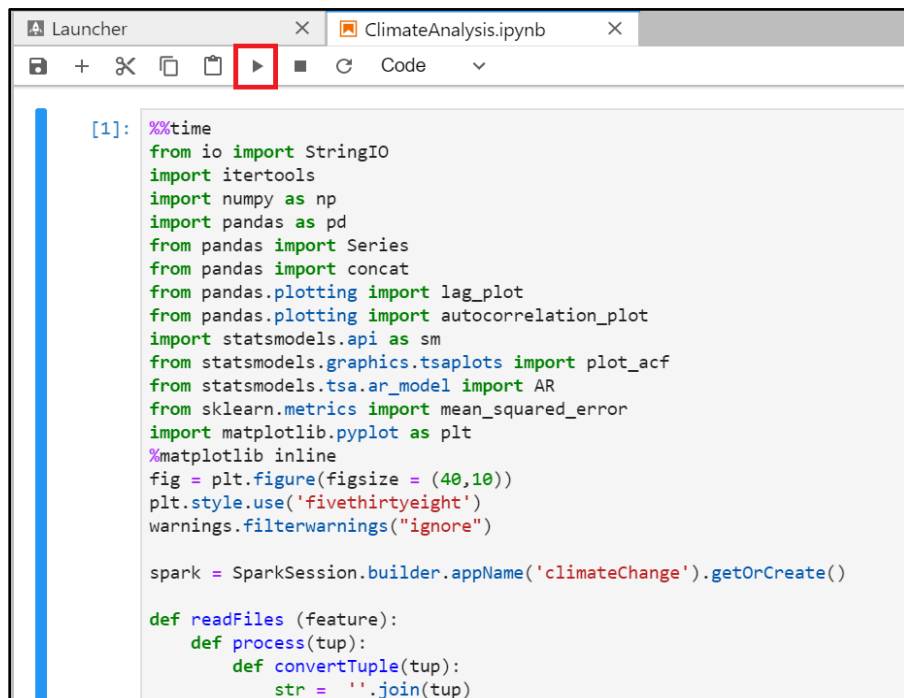
Select “ClimatAnalysis.ipynb” Jupyter Notebook and click open.





## 7. How to run Jupyter Notebook ?

Run the first cell by selecting the cell and click on below button or press Shift + Enter.



Select any hypothesis and then run the cell.

```
[ ]: %%time
# WINTER GETTING WETTER
runPredictionDaily("rainfall", "winter")
# RESULT: Correctly Predicted

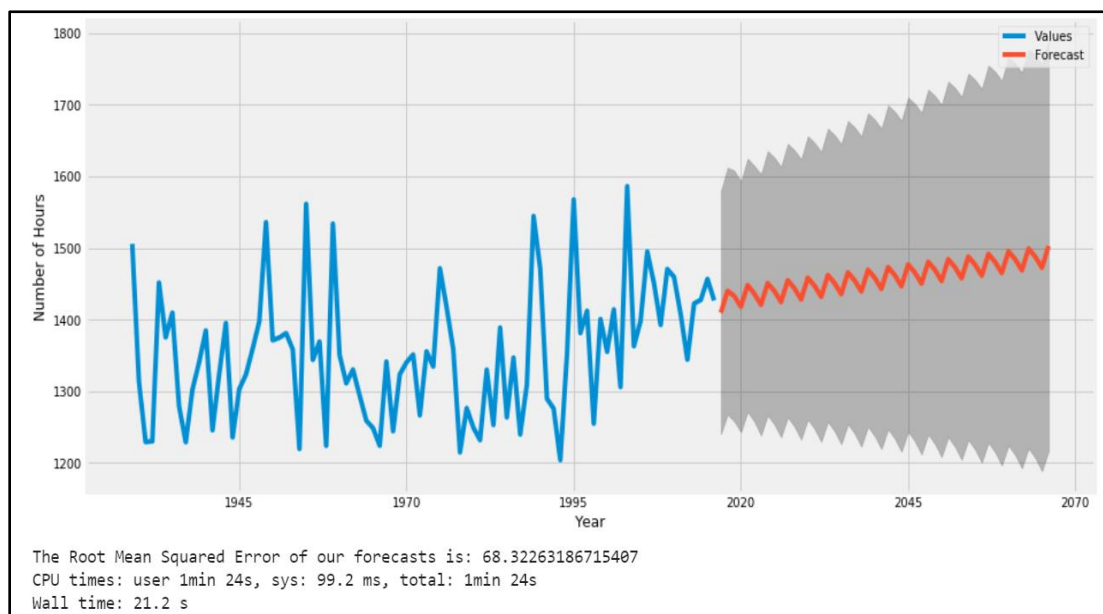
[ ]: %%time
# SNOWFALL DURING WINTER DECREASING
runPredictionMonthly("snow-falling", "winter")
# RESULT : Unpredictable

[ ]: %%time
# SUMMER GETTING DRIER
runPredictionDaily("rainfall", "summer")
# Result: Correctly Predicted

[ ]: %%time
# SUMMER GETTING WARMER
runPredictionDaily("maximum-temperature", "summer")
# Result: Correctly Predicted

[ ]: %%time
# ANNUAL SUNSHINE INCREASING
runPredictionMonthly("sunshine", None)
# Result: Correctly Predicted
```

The output will be displayed below the cell.



# Quick Start for Dash Plotly

At first, you need to install Dash Plotly in your local computer. In order to do this, you need to open CMD on your computer, run

```
pip install dash==0.42.0 # The core dash backend
pip install dash-daq==0.1.0 # DAQ components (newly open-sourced!)
```

After several minutes (this is depending on your computer and network speed), you have completely installed the Dash Plotly.

Then, you should put all the code and .csv file in same folder.

Go to this folder by using CMD and the code 'cd' + 'file path'

```
C:\Users\de11>cd DashPlot
C:\Users\de11\DashPlot>
```

Run the code by entering 'python Dash.py' and after several minutes, a link would appear on your screen;

```
C:\Users\de11\DashPlot>python Dash.py
Running on http://127.0.0.1:8050/
Debugger PIN: 761-136-173
* Serving Flask app "Dash" (lazy loading)
* Environment: production
  WARNING: Do not use the development server in a production environment.
  Use a production WSGI server instead.
* Debug mode: on
```

Finally, copy the link and paste it in a browser. You should see an app, and this means Dash Plotly is running successfully.

