# Running EMC2 on the ARE

The purpose of this document is to describe the process of installing and running the Earth Model Column Collaboratory (EMC2) software on the Australian Research Environment (ARE). You will need:

1. An ARE login
2. Basic knowledge of Python 3 language
3. Basic knowledge of shell language used in a CLI

## Installation

|  |  |
| --- | --- |
| **Task and steps** | **Purpose** |
| 1. Login at <https://are.nci.org.au/> |  |
| 1. Launch a Gadi Terminal and run the following commands:   cd /g/data/jk72/<username>  module load python3/3.11.0  python3 -m venv emc2\_env | Navigate to your personal directory  Load Python for installation of your EMC2 virtual environment  Create the EMC2 virtual environment inside a new folder called ‘emc2\_env’ |
| 1. Launch a JupyterLab session with the following settings:   **Storage**  gdata/qv56+gdata/jk72+gdata/hh5+gdata/rt52+gdata/oi10+gdata/fs38  **Module directories** /g/data/hh5/public/modules  **Modules**  python3/3.11.0  **Python or Conda virtual environment base** /g/data/jk72/<username>/emc2\_env  **Jobfs size** 10GB | Allow access to the most common data storage locations  Allow access to the most useful Python modules  Ensure that Python 3 is preloaded at launch  Activate the virtual environment where the EMC2 will be installed  Allows installation of EMC2 |
| 1. Open your JupyterLab session, open a terminal in a new tab, and run the following commands:   cd /g/data/jk72/<username>/emc2\_env  pip install emc2  *pip install ipykernel*  *python -m ipykernel install --user --name=emc2\_env --display-name=’EMC2 environment'*  *pip install xarray matplotlib pandas numpy==1.23.5*  *pip install pint*  *pip install act-atmos* | Navigate to your personal directory subfolder containing the EMC2 virtual environment  Install the EMC2 module in your virtual environment  Install the ipykernel module in your virtual environment  Install an IPython kernel in your EMC2 virtual environment, kernel name ‘EMC2 environment’  Install the xarray, matplotlib, pandas, and numpy version 1.23.5 modules  Install the pint module  Install the Atmospheric data Community toolkit module |

## First-time link to GitHub repository

Source: <https://www.freecodecamp.org/news/pushing-to-github-made-simple-enough-for-poets/>

|  |  |
| --- | --- |
| **Task and steps** | **Purpose** |
| 1. Create a new GitHub repository at github.com and copy the HTTPS link provided:   https://github.com/<username> /<example\_emc2>.git   1. Create a personal access token (<https://github.com/settings/tokens>) with the **repo** scopes box checked. You may also set no expiry date on the token so that it may be reused, though this comes with security risks. 2. Open your JupyterLab session, open a terminal in a new tab, and run the following commands:   cd /g/data/jk72/<username>/emc2\_project  git init  git add -- . ‘:!data’  git commit -m‘<commit message>’  git remote add origin https://github.com/<username> /<example\_emc2>.git  git remote -v  git push origin master  When pushing to GitHub, you will be prompted to enter your credentials. Enter your GitHub username and the personal access token you created earlier. Do not enter your GitHub password as support for password authentication has been removed. | This link will be entered in the ARE terminal later  Navigates to your personal directory subfolder containing the EMC2 project directory  Create a new git repository in your EMC2 project folder  Add the contents of the folder to the tracked changes in preparation for the first commit, excluding the *data* subfolder and its contents  Prepare the added changes to the folder on your system for pushing to Github, along with a message to describe the commit  Push your existing project contents on the ARE to your Github repository  Does some git push and pull magic to ensure that the contents of your Github repository and your ARE project folder are the same  Pushes the commits from the your local repository’s *master* branch to the *master* branch of the remote repository named *origin* |

## Regular push to GitHub repository

|  |  |
| --- | --- |
| **Task and steps** | **Purpose** |
| cd /g/data/jk72/<username>/emc2\_project  git add -- . ‘:!data’  git commit -m’<commit message>’  git push origin master  When pushing to GitHub, you will be prompted to enter your credentials. Enter your GitHub username and the personal access token you created earlier. Do not enter your GitHub password as support for password authentication has been removed. | Navigates to your personal directory subfolder containing the EMC2 project directory  Add the contents of the folder to the tracked changes in preparation for the first commit, excluding the *data* subfolder and its contents  Prepare the added changes to the folder on your system for pushing to Github, along with a message to describe the commit  Pushes the commits from the your local repository’s *master* branch to the *master* branch of the remote repository named *origin* |

## Additional information

|  |  |
| --- | --- |
| **Task and steps** | **Purpose** |
| module load netcdf  ncdump -h ‘filename’ | Activate the environment settings associated with the NetCDF package, allowing its use within the terminal  Displays the header information (metadata) of the target NetCDF defined by ‘filename’ |
|  |  |
|  |  |