# Set up virtual environment

- Log on graham with X11 forwarding (Xquartz on MacOS, MobaXterm on Windows):
  - ssh -Y your_guess_account@coss-b.c3.ca
- Download codes and data:
  - wget https://rhpcs.mcmaster.ca/~guanw/coss2024-ml.tar.gz
  - tar xzf coss2024-ml.tar.gz
  - cd coss2024
- Create an virtual environment
  - source setup_venv.sh

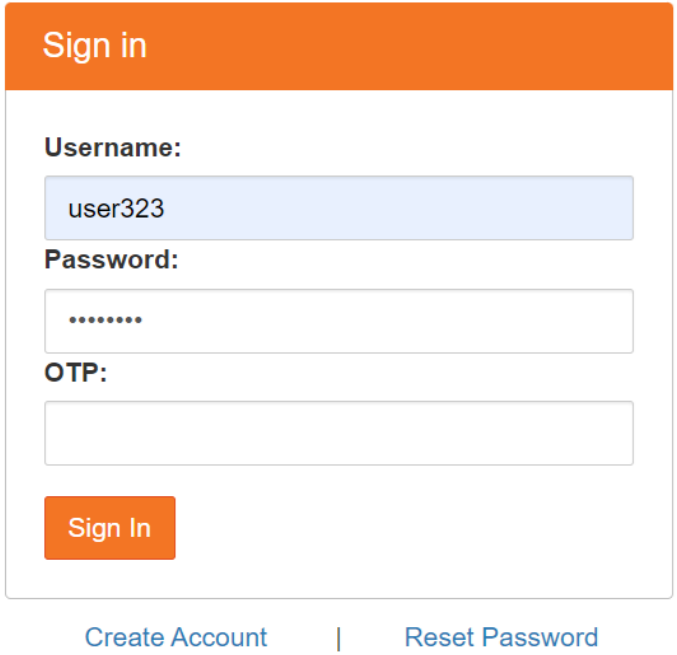
You need to do the above setup steps ONLY ONCE!

# Run examples

- On terminal
  - ssh -Y your_guess_account@coss-b.c3.ca
  - cd coss2024
  - source activate_venv.sh

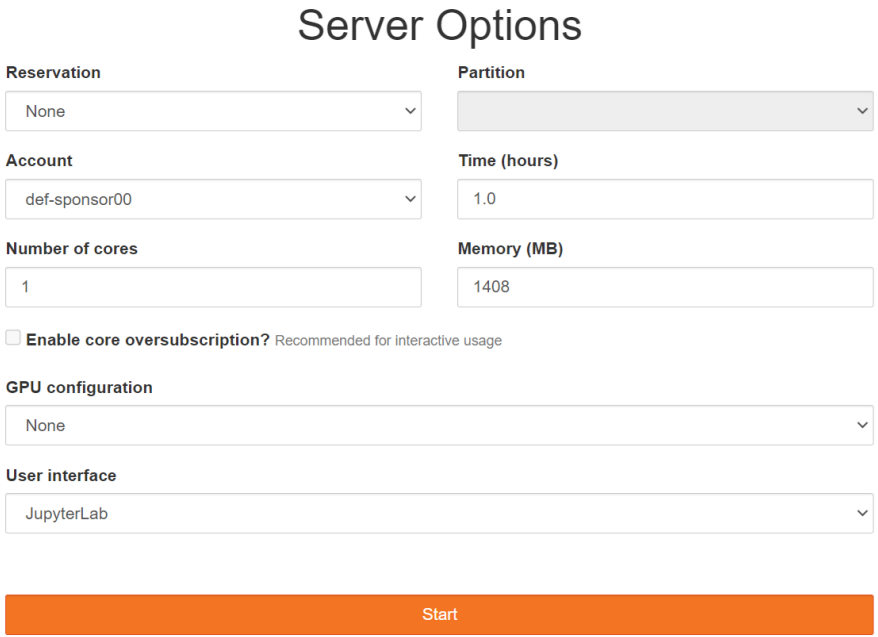
# Run examples (cont.)

- On Jupyterlab
  - Type ”jupyter.coss-b.c3.ca” at the address bar of your web browser
  - Sign in with your username and password



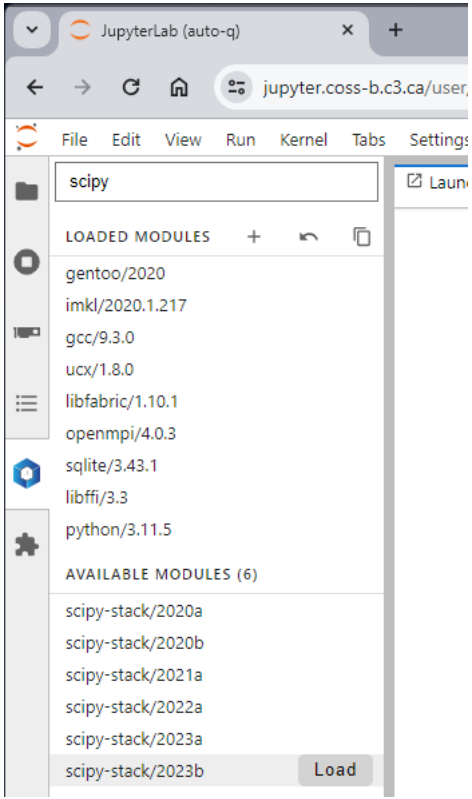
# Run examples (cont.)

- On Jupyterlab
  - Type ”jypyter.coss-b.c3.ca” at the address bar of your web browser
  - Sign in with your username and password
  - Click ”start” to take the default setting



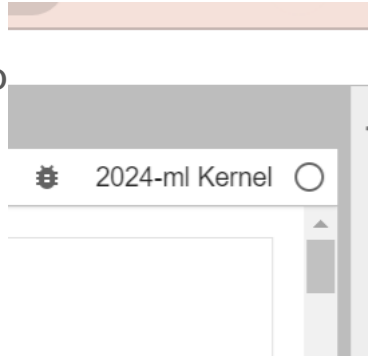
# Run examples (cont.)

- On Jupyterlab
  - Type ”jupyter.coss-b.c3.ca” at the address bar of your web browser
  - Sign in with your username and password
  - Click ”start” to take the default setting
  - In the Software tab and load modules:
    - Scipy-stack/2023b
    - Python/3.11.5



# Run examples (cont.)

- On Jupyterlab
  - Type ”jupyter.coss-b.c3.ca” at the address bar of your web bro
  - Sign in with your username and password
  - Click ”start” to take the default setting
  - In the Software tab and load modules:
    - Scipy-stack/2023b
    - Python/3.11.5
  - In the File Browser tab , find and load the notebook ” kaggle-titanic-competition.ipynb”.
    - Make sure kernel ”2024-ml Kernel” is selected on the upper-right corner



# A Kaggle Competition

**Task**: Predicting survivals of Titanic passengers

**Source**: https://www.kaggle.com/competitions/titanic

**Type of problem**: Classification not regression

# Appendix

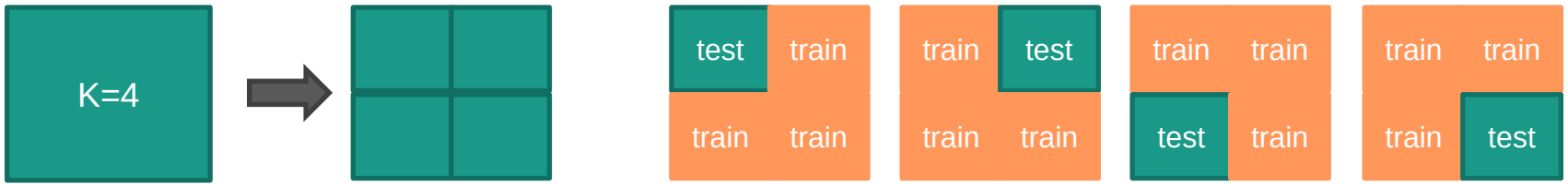
- N-fold cross validation
- Evaluation metrics

# Evaluate trained models

Data:

- Training (in training)
- Validating (during training)
- Testing (after training)

If Dataset is small, K-fold cross validation can be used



# Evaluation metrics for regression

- MSE: $\frac{1}{m}\sum_{i=1}^{m}(\widehat{y_i} - y_i)^2$
- MAE: $\frac{1}{m}\sum_{i=1}^{m}|\widehat{y_i} - y_i|$
- RMSE: sqrt(MSE)
- Binary cross entropy: $\frac{1}{m}\sum_{1}^{m} -(y_i log(\widehat{y_i}) + (1 - y_i)\log(1 - \widehat{y_i}))$
- …