User Manuel

Group 3

1. Download Anaconda Python 3.7 Version and install it. https://www.anaconda.com/distribution/
2. Download pytorch. Go to https://pytorch.org/ to find the command according to your CUDA version and OS. Then open Anaconda Prompt and run the command.
3. Then, enter the COMP4434_SourceCode_Group3 folder in Anaconda Prompt by using cd command.
4. There are two py files, one is Module.py, the other is cnn.py. We design two models. The default version is Time Efficient Model. Use *python Module.py* command to run our Time Efficient Model.
   The default configuration of this model is
   Kernel Size = 3
   Epoches = 50
   Batch Size = 64
   Number of Filters = 256
   Dropout = 0.5
   Learning Rate=0.001
   Hidden Layer=1

   If you want to run the Better Performance Model, please open the cnn.py and uncomment line 22 and line 23 and change line 30 to *self.dropout = nn.Dropout(0.7)*
   Save the file then run *python Module.py* command in Anaconda Prompt.
   The configuration of this model is
   Kernel Size = 3
   Epoches = 50
   Batch Size = 64
   Number of Filters = 256
   Dropout = 0.7
   Learning Rate=0.001
   Hidden Layer=2
5. You can also change the number of epoch, learning rate and batch size by changing the parameter of line 10,11,12 of cnn.py.
6. When you run the program, you will see the following information. You can use your own training data by entering the in/out Flow file name and Meteorology file name. Or you can enter n to use the default input file.

   ```
   Please enter files to train the model (in the format of "FlowFile MeteorologyFile", enter n to use the default input files)
   >n
   ```

   After running the program, you will see Training MSE Loss, Training RMSE Loss, Training L1 Loss and training time of each epoch. You can also see the Testing MSE Loss, Testing RMSE Loss and Testing L1 Loss.

```
epoch50
* * * * * * * * * * * * * * * * * * * * *
Finish 50 epoch, MSELoss:454.398582, RMSELoss:21.316627, L1Loss:11.850740, with 11.385 seconds

Test Inflows Distribution: Max value: 1151.0, Mean: 92.1, Median: 51.0
Test Outflows Distribution: Max value: 1160.0, Mean: 92.1, Median: 51.0

CNN regression module test:
Test Result:
MSELoss:404.713248, RMSELoss:20.117486, L1Loss:11.472667, with 1.856 seconds
Test Predicted Inflows Distribution: Max value: 1173.2, Mean: 93.4, Median: 53.6
Test Predicted Outflows Distribution: Max value: 1171.5, Mean: 92.9, Median: 53.1
```