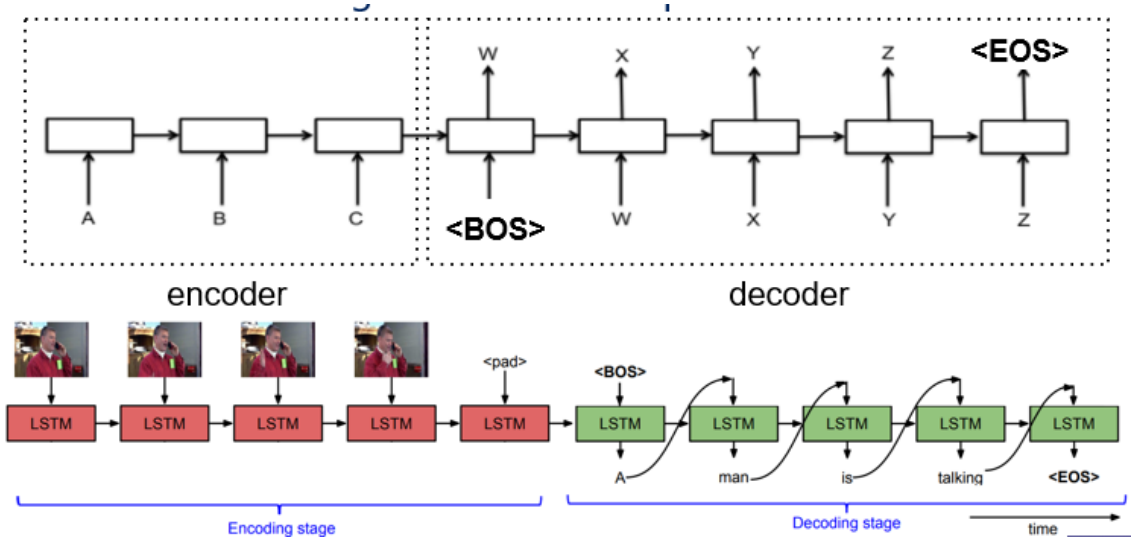
Github: https://github.com/yanziminga/DL_HW2

HW2: Video caption generation

1.DL_HW2 folder is arranged as the following figure:

```
DL_HW2/
    MLDS_hw2_1_data
        testing_data
            feat
                #100files, .npy
            video
                #100files, .avi
            id.txt
        training_data
            feat
                #1450files, .npy
            video
                #1450files, .avi
            id.txt
        bleu_eval.py
        sample_output_testset.txt
        testing_label.json
        training_label.json
    model
    bleu_eval.py
    data_tokenizer.pickle
    dataprocess.py
    hw2_seq2seq.sh
    model_seq2seq.py
    test_result.txt
```

2.Model architecture



This model is the same as the model showed in the HW2 slide, using two recurrent neural networks to implement video caption.

3.Experiment setup

Model parameters:
- LSTM input number:4096
- LSTM hidden number:256
- Frame numbers: 80
- Forget bias (encoding):1
- Forget bias (decoding):1
- Dropout probability:0.5
- Sampling probability:0.8

Training parameters:
- Batch_size: 64
- Epoch: 200
- Learning rate:0.001

4.Training and testing model

Making sure the data put in the same directory as the following figure mentioned, and then run the following command.

- **Run shell script:**

  $ sh hw2_seq2seq.sh ./MLDS_hw2_1_data/testing_data/feat/ test_result.txt

- **Training:**

  Comment the model testing part and run the following command:

```
if __name__ == '__main__':

    # model training:

    train_dict="./MLDS_hw2_1_data/training_data/feat/"
    train_label_dir="./MLDS_hw2_1_data/training_label.json"
    train(train_dict,train_label_dir)

    # model testing:
    test_dict = sys.argv[1]
    test(test_dict)
```

  $ python model_seq2seq.py

- **Testing:**

  Comment the model training part and run following command:

  $ python model_seq2seq.py ./MLDS_hw2_1_data/testing_data/feat/

5.Part of Training Process:

```
strating training
Epoch 0:        Loss:  3.574616
Epoch 1:        Loss:  3.3132539
Epoch 2:        Loss:  3.1598806
Epoch 3:        Loss:  2.8253188
Epoch 4:        Loss:  2.5950592
Epoch 5:        Loss:  2.7108717
Epoch 6:        Loss:  2.3857849
Epoch 7:        Loss:  2.3427796
Epoch 8:        Loss:  2.2593322
Epoch 9:        Loss:  2.283772
Epoch 10:        Loss:  1.9754347
Epoch 11:        Loss:  2.051643
Epoch 12:        Loss:  2.1853435
Epoch 13:        Loss:  1.7656587
Epoch 14:        Loss:  1.8214067
Epoch 15:        Loss:  1.7004318
Epoch 16:        Loss:  1.7944019
Epoch 17:        Loss:  2.0439446
Epoch 18:        Loss:  1.7167103
Epoch 19:        Loss:  1.5358512
Epoch 20:        Loss:  1.8420618
Epoch 21:        Loss:  1.7530346
Epoch 22:        Loss:  1.5781815
Epoch 23:        Loss:  1.7184737
Epoch 24:        Loss:  1.8228527
Epoch 25:        Loss:  1.6156762
Epoch 26:        Loss:  1.4646175
Epoch 27:        Loss:  1.7709312
Epoch 28:        Loss:  1.5297921
Epoch 29:        Loss:  1.5506718
Epoch 30:        Loss:  1.3788666
Epoch 31:        Loss:  1.5054392
Epoch 32:        Loss:  1.6563671
Epoch 33:        Loss:  1.4623976
Epoch 34:        Loss:  1.3712451
Epoch 35:        Loss:  1.4506719
Epoch 36:        Loss:  1.3812758
Epoch 37:        Loss:  1.3200791
Epoch 38:        Loss:  1.276305
Epoch 39:        Loss:  1.5090934
Epoch 40:        Loss:  1.534674
Epoch 41:        Loss:  1.3054469
Epoch 42:        Loss:  1.4352272
Epoch 43:        Loss:  1.3162374
```

6. Model performance:

```
Load model from:
/home/zimingy/DL_HW2 /model/

Testing Output: /home/zimingy/DL_HW2/test_result.txt

Average bleu score is : 0.71333

(dl) [zimingy@node0229 DL_HW2]$
```