

```
Entering function __main__
Embedding tokens size=400001
File name 5way_tur_ger_rus_fra_usa100K_25-150. Total data size is 500000
Our 5 labels to index dictionary ={u'turkey': 3, u'germany': 1, u'russia':
2, u'us': 4, u'france': 0}
Our 5 index to labels dictionary ={0: u'france', 1: u'germany', 2: u'russia
', 3: u'turkey', 4: u'us'}
x_train: 405000, x_dev: 45000, x_test: 50000
y_train: 405000, y_dev: 45000, y_test: 50000
input_data_x_batch shape: (200, 150)
input_labels_batch shape: (200, 5)
data(after embedding) shape: (200, 150, 300)
gru_forward_cell units: 300
gru_forward_cell2 units: 300
multi_forward_cell: 2 cells
gru_backward_cell units: 300
gru_backward_cell2 units: 300
multi_backward_cell: 2 cells
---vars name and shapes---
(u'bidirectional_rnn/fw/multi_rnn_cell/cell_0/gru_cell/gates/kernel:0', Ten
sorShape([Dimension(600), Dimension(600)]), 360000)
(u'bidirectional_rnn/fw/multi_rnn_cell/cell_0/gru_cell/gates/bias:0', Tenso
rShape([Dimension(600)]), 600)
(u'bidirectional_rnn/fw/multi_rnn_cell/cell_0/gru_cell/candidate/kernel:0',
TensorShape([Dimension(600), Dimension(300)]), 180000)
(u'bidirectional_rnn/fw/multi_rnn_cell/cell_0/gru_cell/candidate/bias:0', T
ensorShape([Dimension(300)]), 300)
(u'bidirectional_rnn/fw/multi_rnn_cell/cell_1/gru_cell/gates/kernel:0', Ten
sorShape([Dimension(600), Dimension(600)]), 360000)
(u'bidirectional_rnn/fw/multi_rnn_cell/cell_1/gru_cell/gates/bias:0', Tenso
rShape([Dimension(600)]), 600)
(u'bidirectional_rnn/fw/multi_rnn_cell/cell_1/gru_cell/candidate/kernel:0',
TensorShape([Dimension(600), Dimension(300)]), 180000)
(u'bidirectional_rnn/fw/multi_rnn_cell/cell_1/gru_cell/candidate/bias:0', T
ensorShape([Dimension(300)]), 300)
(u'bidirectional_rnn/bw/multi_rnn_cell/cell_0/gru_cell/gates/kernel:0', Ten
sorShape([Dimension(600), Dimension(600)]), 360000)
(u'bidirectional_rnn/bw/multi_rnn_cell/cell_0/gru_cell/gates/bias:0', Tenso
rShape([Dimension(600)]), 600)
(u'bidirectional_rnn/bw/multi_rnn_cell/cell_0/gru_cell/candidate/kernel:0',
TensorShape([Dimension(600), Dimension(300)]), 180000)
(u'bidirectional_rnn/bw/multi_rnn_cell/cell_0/gru_cell/candidate/bias:0', T
ensorShape([Dimension(300)]), 300)
(u'bidirectional_rnn/bw/multi_rnn_cell/cell_1/gru_cell/gates/kernel:0', Ten
sorShape([Dimension(600), Dimension(600)]), 360000)
(u'bidirectional_rnn/bw/multi_rnn_cell/cell_1/gru_cell/gates/bias:0', Tenso
rShape([Dimension(600)]), 600)
```

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(u'bidirectional_rnn/bw/multi_rnn_cell/cell_1/gru_cell/candidate/kernel:0',
TensorShape([Dimension(600), Dimension(300)]), 180000)
(u'bidirectional_rnn/bw/multi_rnn_cell/cell_1/gru_cell/candidate/bias:0', T
ensorShape([Dimension(300)]), 300)
(u'Variable:0', TensorShape([Dimension(600), Dimension(5)]), 3000)
(u'bias:0', TensorShape([Dimension(5)]), 5)
total PARAM 2,166,605
---done vars---
batches_num_train: 2025
batches_num_dev: 225
12:55:51
Epoch: 1/10 ---- best so far on epoch 0: acc=0.0000%
    DEV accuracy on epoch 1/10 in train step 1012 = 50.6422%
    Dev loss average for this epoch is 158.9138 and average acc is 50.6422
        Class turkey : (6807/9054) -> accuracy: 75.1822%
        Class germany: (4457/9053) -> accuracy: 49.2323%
        Class russia : (5313/8996) -> accuracy: 59.0596%
        Class us      : (2812/8854) -> accuracy: 31.7597%
        Class france : (3400/9043) -> accuracy: 37.5981%
INFO:root:    Saved model ../model_1535374548/model.ckpt at epoch 1
INFO:root:    Best accuracy 50.6422% at epoch 1/10 (22789/45000)
    DEV accuracy on epoch 1/10 in train step 2022 = 53.4600%
    Dev loss average for this epoch is 15.5224 and average acc is 53.4600
        Class turkey : (5893/9054) -> accuracy: 65.0873%
        Class germany: (5148/9053) -> accuracy: 56.8651%
        Class russia : (4510/8996) -> accuracy: 50.1334%
        Class us      : (4849/8854) -> accuracy: 54.7662%
        Class france : (3657/9043) -> accuracy: 40.4401%
INFO:root:    Saved model ../model_1535374548/model.ckpt at epoch 1
INFO:root:    Best accuracy 53.4600% at epoch 1/10 (24057/45000)
Epoch run time: 00:44:45
Train average loss for this epoch is 285.1698 and average acc is 43.6768
#####
#####
13:40:37
Epoch: 2/10 ---- best so far on epoch 1: acc=53.4600%
    DEV accuracy on epoch 2/10 in train step 1012 = 54.9644%
    Dev loss average for this epoch is 1.6537 and average acc is 54.9644
        Class turkey : (6439/9054) -> accuracy: 71.1177%
        Class germany: (4549/9053) -> accuracy: 50.2485%
        Class russia : (5945/8996) -> accuracy: 66.0849%
        Class us      : (4122/8854) -> accuracy: 46.5552%
        Class france : (3679/9043) -> accuracy: 40.6834%
INFO:root:    Saved model ../model_1535374548/model.ckpt at epoch 2
INFO:root:    Best accuracy 54.9644% at epoch 2/10 (24734/45000)
    DEV accuracy on epoch 2/10 in train step 2022 = 55.6022%
    Dev loss average for this epoch is 1.1947 and average acc is 55.6022

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Class turkey : (5423/9054) -> accuracy: 59.8962%
Class germany: (5361/9053) -> accuracy: 59.2179%
Class russia : (5340/8996) -> accuracy: 59.3597%
Class us      : (5043/8854) -> accuracy: 56.9573%
Class france : (3854/9043) -> accuracy: 42.6186%
INFO:root:    Saved model ../model_1535374548/model.ckpt at epoch 2
INFO:root:    Best accuracy 55.6022% at epoch 2/10 (25021/45000)
Epoch run time: 00:44:36
Train average loss for this epoch is 3.4634 and average acc is 55.2032
#####
#####
14:25:13
Epoch: 3/10 ---- best so far on epoch 2: acc=55.6022%
DEV accuracy on epoch 3/10 in train step 1012 = 56.1844%
Dev loss average for this epoch is 1.1761 and average acc is 56.1844
Class turkey : (6277/9054) -> accuracy: 69.3285%
Class germany: (4700/9053) -> accuracy: 51.9165%
Class russia : (5958/8996) -> accuracy: 66.2294%
Class us      : (4279/8854) -> accuracy: 48.3284%
Class france : (4069/9043) -> accuracy: 44.9961%
INFO:root:    Saved model ../model_1535374548/model.ckpt at epoch 3
INFO:root:    Best accuracy 56.1844% at epoch 3/10 (25283/45000)
DEV accuracy on epoch 3/10 in train step 2022 = 56.4711%
Dev loss average for this epoch is 1.1780 and average acc is 56.4711
Class turkey : (5807/9054) -> accuracy: 64.1374%
Class germany: (5421/9053) -> accuracy: 59.8807%
Class russia : (5085/8996) -> accuracy: 56.5251%
Class us      : (5017/8854) -> accuracy: 56.6637%
Class france : (4082/9043) -> accuracy: 45.1399%
INFO:root:    Saved model ../model_1535374548/model.ckpt at epoch 3
INFO:root:    Best accuracy 56.4711% at epoch 3/10 (25412/45000)
Epoch run time: 00:44:36
Train average loss for this epoch is 1.1483 and average acc is 57.8872
#####
#####
15:09:50
Epoch: 4/10 ---- best so far on epoch 3: acc=56.4711%
DEV accuracy on epoch 4/10 in train step 1012 = 56.6867%
Dev loss average for this epoch is 1.1691 and average acc is 56.6867
Class turkey : (6147/9054) -> accuracy: 67.8926%
Class germany: (4704/9053) -> accuracy: 51.9607%
Class russia : (6076/8996) -> accuracy: 67.5411%
Class us      : (4192/8854) -> accuracy: 47.3458%
Class france : (4390/9043) -> accuracy: 48.5458%
INFO:root:    Saved model ../model_1535374548/model.ckpt at epoch 4
INFO:root:    Best accuracy 56.6867% at epoch 4/10 (25509/45000)
DEV accuracy on epoch 4/10 in train step 2022 = 56.4978%
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Dev loss average for this epoch is 1.1895 and average acc is 56.4978
Class turkey : (6230/9054) -> accuracy: 68.8094%
Class germany: (5490/9053) -> accuracy: 60.6429%
Class russia : (4940/8996) -> accuracy: 54.9133%
Class us      : (5135/8854) -> accuracy: 57.9964%
Class france : (3629/9043) -> accuracy: 40.1305%
Epoch run time: 00:44:35
Train average loss for this epoch is 1.0975 and average acc is 60.6437
#####
#####
15:54:26
Epoch: 5/10 ---- best so far on epoch 4: acc=56.6867%
DEV accuracy on epoch 5/10 in train step 1012 = 56.5600%
Dev loss average for this epoch is 1.1806 and average acc is 56.5600
Class turkey : (6023/9054) -> accuracy: 66.5231%
Class germany: (4584/9053) -> accuracy: 50.6351%
Class russia : (5661/8996) -> accuracy: 62.9280%
Class us      : (4685/8854) -> accuracy: 52.9139%
Class france : (4499/9043) -> accuracy: 49.7512%
DEV accuracy on epoch 5/10 in train step 2022 = 46.3444%
Dev loss average for this epoch is 1.3882 and average acc is 46.3444
Class turkey : (4678/9054) -> accuracy: 51.6678%
Class germany: (7551/9053) -> accuracy: 83.4088%
Class russia : (3177/8996) -> accuracy: 35.3157%
Class us      : (3007/8854) -> accuracy: 33.9621%
Class france : (2442/9043) -> accuracy: 27.0043%
Epoch run time: 00:44:32
Train average loss for this epoch is 1.0541 and average acc is 63.0852
#####
#####
16:38:58
Epoch: 6/10 ---- best so far on epoch 4: acc=56.6867%
DEV accuracy on epoch 6/10 in train step 1012 = 56.3444%
Dev loss average for this epoch is 1.2010 and average acc is 56.3444
Class turkey : (5628/9054) -> accuracy: 62.1604%
Class germany: (4533/9053) -> accuracy: 50.0718%
Class russia : (5861/8996) -> accuracy: 65.1512%
Class us      : (5058/8854) -> accuracy: 57.1267%
Class france : (4275/9043) -> accuracy: 47.2741%
DEV accuracy on epoch 6/10 in train step 2022 = 56.2600%
Dev loss average for this epoch is 1.1999 and average acc is 56.2600
Class turkey : (6018/9054) -> accuracy: 66.4679%
Class germany: (4881/9053) -> accuracy: 53.9158%
Class russia : (5104/8996) -> accuracy: 56.7363%
Class us      : (4821/8854) -> accuracy: 54.4500%
Class france : (4493/9043) -> accuracy: 49.6848%
Epoch run time: 00:44:32
```

Train average loss for this epoch is 1.0237 and average acc is 64.9410  
#####  
#####

17:23:30

Epoch: 7/10 ---- best so far on epoch 4: acc=56.6867%

DEV accuracy on epoch 7/10 in train step 1012 = 55.9644%

Dev loss average for this epoch is 1.2170 and average acc is 55.9644

Class turkey : (5712/9054) -> accuracy: 63.0881%

Class germany: (4495/9053) -> accuracy: 49.6520%

Class russia : (5539/8996) -> accuracy: 61.5718%

Class us : (4745/8854) -> accuracy: 53.5916%

Class france : (4693/9043) -> accuracy: 51.8965%

DEV accuracy on epoch 7/10 in train step 2022 = 56.2911%

Dev loss average for this epoch is 1.2234 and average acc is 56.2911

Class turkey : (6024/9054) -> accuracy: 66.5341%

Class germany: (5014/9053) -> accuracy: 55.3850%

Class russia : (5417/8996) -> accuracy: 60.2157%

Class us : (4776/8854) -> accuracy: 53.9417%

Class france : (4100/9043) -> accuracy: 45.3389%

Epoch run time: 00:44:32

Train average loss for this epoch is 0.9780 and average acc is 67.3351

#####  
#####

18:08:03

Epoch: 8/10 ---- best so far on epoch 4: acc=56.6867%

DEV accuracy on epoch 8/10 in train step 1012 = 55.9156%

Dev loss average for this epoch is 1.2416 and average acc is 55.9156

Class turkey : (5920/9054) -> accuracy: 65.3855%

Class germany: (4603/9053) -> accuracy: 50.8450%

Class russia : (5460/8996) -> accuracy: 60.6936%

Class us : (4820/8854) -> accuracy: 54.4387%

Class france : (4359/9043) -> accuracy: 48.2030%

DEV accuracy on epoch 8/10 in train step 2022 = 55.4378%

Dev loss average for this epoch is 1.2433 and average acc is 55.4378

Class turkey : (5886/9054) -> accuracy: 65.0099%

Class germany: (4683/9053) -> accuracy: 51.7287%

Class russia : (5524/8996) -> accuracy: 61.4051%

Class us : (4811/8854) -> accuracy: 54.3370%

Class france : (4043/9043) -> accuracy: 44.7086%

Epoch run time: 00:44:32

Train average loss for this epoch is 0.9369 and average acc is 69.5684

#####  
#####

18:52:36

Epoch: 9/10 ---- best so far on epoch 4: acc=56.6867%

DEV accuracy on epoch 9/10 in train step 1012 = 55.4444%

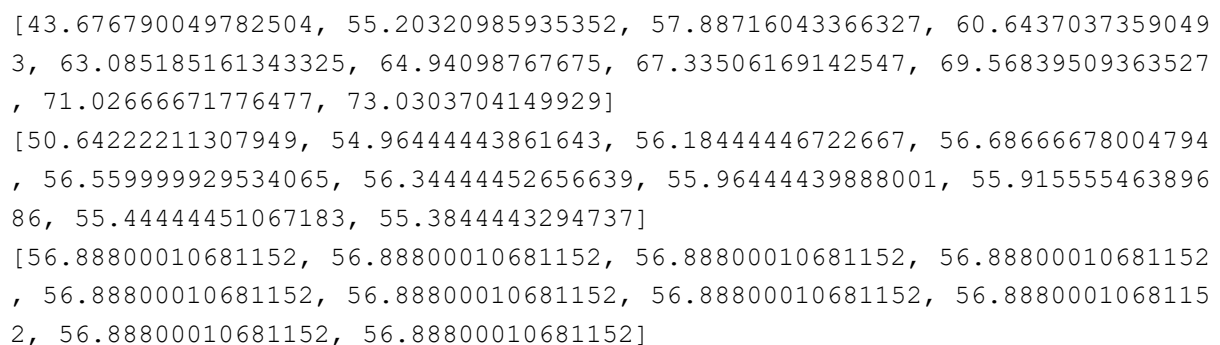
Dev loss average for this epoch is 1.2731 and average acc is 55.4444

```

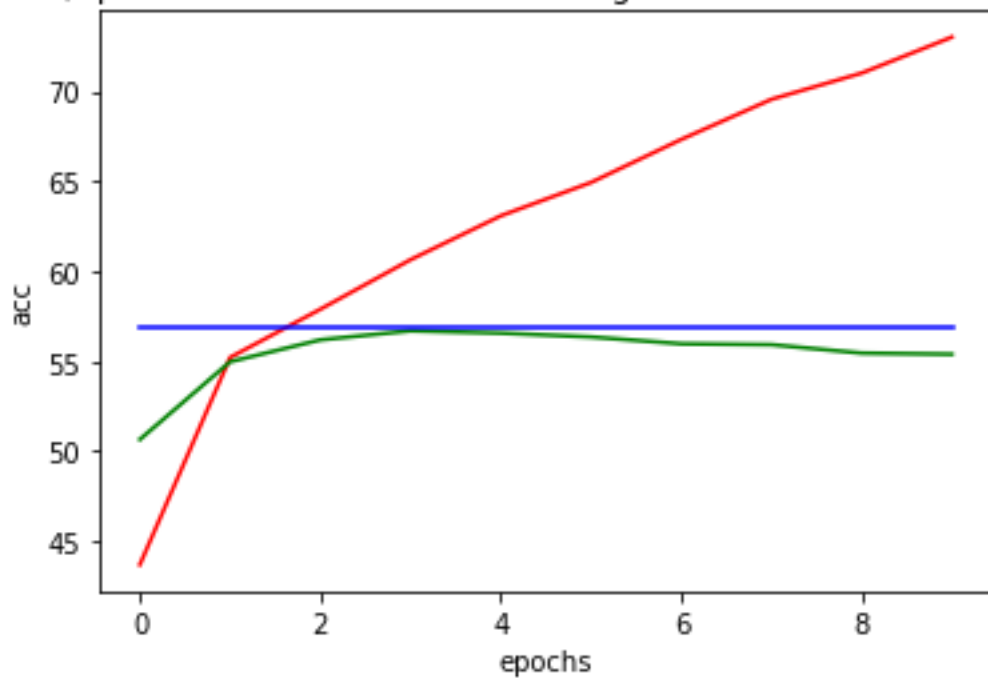
        Class turkey : (6051/9054) -> accuracy: 66.8323%
        Class germany: (4764/9053) -> accuracy: 52.6234%
        Class russia : (5479/8996) -> accuracy: 60.9048%
        Class us      : (4413/8854) -> accuracy: 49.8419%
        Class france : (4243/9043) -> accuracy: 46.9203%
    DEV accuracy on epoch 9/10 in train step 2022 = 55.5667%
    Dev loss average for this epoch is 1.2537 and average acc is 55.5667
        Class turkey : (5932/9054) -> accuracy: 65.5180%
        Class germany: (5120/9053) -> accuracy: 56.5558%
        Class russia : (5182/8996) -> accuracy: 57.6034%
        Class us      : (4545/8854) -> accuracy: 51.3327%
        Class france : (4226/9043) -> accuracy: 46.7323%
Epoch run time: 00:44:32
Train average loss for this epoch is 0.9083 and average acc is 71.0267
#####
#####
19:37:09
Epoch: 10/10 ---- best so far on epoch 4: acc=56.6867%
    DEV accuracy on epoch 10/10 in train step 1012 = 55.3844%
    Dev loss average for this epoch is 1.3215 and average acc is 55.3844
        Class turkey : (6189/9054) -> accuracy: 68.3565%
        Class germany: (4733/9053) -> accuracy: 52.2810%
        Class russia : (5735/8996) -> accuracy: 63.7506%
        Class us      : (4338/8854) -> accuracy: 48.9948%
        Class france : (3928/9043) -> accuracy: 43.4369%
    DEV accuracy on epoch 10/10 in train step 2022 = 55.5733%
    Dev loss average for this epoch is 1.2735 and average acc is 55.5733
        Class turkey : (5805/9054) -> accuracy: 64.1153%
        Class germany: (4873/9053) -> accuracy: 53.8275%
        Class russia : (5310/8996) -> accuracy: 59.0262%
        Class us      : (4564/8854) -> accuracy: 51.5473%
        Class france : (4456/9043) -> accuracy: 49.2757%
Epoch run time: 00:44:32
Train average loss for this epoch is 0.8679 and average acc is 73.0304
#####
#####
***Training is complete. Best accuracy 56.6867% at epoch 4/10
***Testing...
INFO:tensorflow:Restoring parameters from ../model_1535374548/model.ckpt
INFO:tensorflow:Restoring parameters from ../model_1535374548/model.ckpt
    Test loss average for this epoch is 1.1650 and average acc is 56.8880
    Accuracy on test set - (28444/50000) -> accuracy: 56.8880%
        Class turkey : (6653/9982) -> accuracy: 66.6500%
        Class germany: (5197/9919) -> accuracy: 52.3944%
        Class russia : (6849/10119) -> accuracy: 67.6846%
        Class us      : (4741/9959) -> accuracy: 47.6052%
        Class france : (5004/10021) -> accuracy: 49.9351%

```

loss/epochs(train in red, validation in green, test(constant) in blue



acc/epochs(train in red, validation in green, test(constant) in blue)



End s

ummary -----

data:

DATA\_FILE\_PATH is ../input/5way\_tur\_ger\_rus\_fra\_usa100K\_25-150.txt  
MINIMUM\_ROW\_LENGTH is 25  
MAXIMUM\_ROW\_LENGTH is 150  
COUNT\_WORD is 20  
lines\_per\_class is 100000  
number of classes is 5  
Total data size is 500000

embedding:

EMB\_FILE\_PATH ../input/glove.6B.300d.txt  
EMB\_DIM 300  
EMB\_WORDS\_COUNT 400001

run config:

EPOCHS 10  
evaluating on dev data 2 times per epoch  
KEEP\_PROB 0.5  
BATCH\_SIZE 200  
GRU\_HIDDEN\_UNITS 300  
CELL\_TYPE GRU  
optimizer is adamOptimizer - learn rate: 0.001

model:

USE\_TMP\_FOLDER False  
mdl\_path ../model\_1535374548/model.ckpt

results:

best training acc at epoch=4 is 56.6867  
testing acc 56.8880

Time(HH:MM:SS): 07:29:43



Leaving function `__main__`