Digital Speech Processing HW2

Part 1

```
                                   cat result/accuracy
====================== HTK Results Analysis =======================
  Date: Wed Nov 21 11:41:21 2018
  Ref : labels/answer.mlf
  Rec : result/result.mlf
------------------------ Overall Results --------------------------
SENT: %Correct=38.54 [H=185, S=295, N=480]
WORD: %Corr=96.61, Acc=74.34 [H=1679, D=13, S=46, I=387, N=1738]
===================================================================
```

Part 2

```
====================== HTK Results Analysis =======================
  Date: Wed Nov 21 19:23:29 2018
  Ref : labels/answer.mlf
  Rec : result/result.mlf
------------------------ Overall Results --------------------------
SENT: %Correct=90.00 [H=432, S=48, N=480]
WORD: %Corr=97.24, Acc=96.84 [H=1690, D=32, S=16, I=7, N=1738]
===================================================================
```

Part 3

Modified files

`proto`:

- Increased number of states to 12.
- Transition matrix is a continuation of the original matrix, with the final row having a single 1.0 as its last element.

`03_training.sh`:

- Number of iterations in steps 01, 03, and 05 increased to **11**.

`lib/mix2_10.hed`:

- Number of Gaussian mixtures for **all** models increased to **25**.

Interesting discoveries

- Increasing the number of iterations too many times causes the accuracy to go down.
- It is possible to obtain the desired accuracy simply by increasing the number of states to around 15 and leaving the other 2 files untouched.
    - That is, it seems that the number of states of the HMM seem to be the most impactful factor.
- The file that impacts time the most is `lib/mix2_10.hed`; increasing the number of mixtures

creates a great difference in execution time.