Homework 2 Report

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This report is used to ensure that TAs can execute my files successfully and understand variable values clearly.

1 Execution

1. **Environment:** Docker Engine 19.03.13, with Kaldi Speech Recognition Toolkit.
2. **Commands:**

```
###Download my zip file and unzip it
cd b07611039
source 0-activate.sh
bash 1-preprocess.sh
bash 2-extract-feat.sh
bash 3-train.sh
bash 4-test.sh
```

2 Results

1. The accuracy is 96.60 % with 13 iterations, 1300 Gaussians, test set with acoustic weight 0.27 and test bean value equal to 40.
2. I did an easy A/B test for each variable to find how variables influence the model. With the minor adjustment for the value of variables, I spend 3 hours setting up the docker environment and got the 85 % accuracy with about 30 tests, and this result made me anxious since I did this homework lately.
3. After discussing with classmates and studying the model again, I found that the tendency of the adjustment to the variables was correct but the variation was too small. For example, the original number of Gaussians was less than 100, but evidently it wasn't large enough. With this observation, I increased the number of Gaussians up to 1000 and the test beam value to 40, which received a significant impact on accuracy and made the accuracy increase to 96.60 %.
4. The reason why the number of Gaussian affects the accuracy is that it can simulate the probability model more accurately with more Gaussians. In addition, with the higher beam value, it can check more paths when doing beam search. In conclusion, those are the reasons why I could improve accuracy from 85 % to over 95 %.