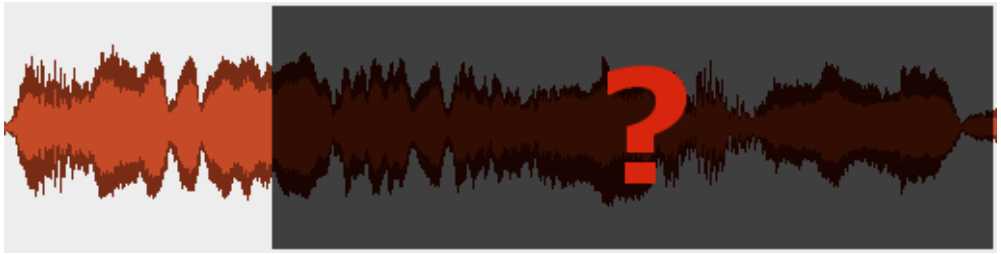
Lab Assignment 10

Enhance! You've probably seen a movie or TV show where the super spy agents use some unbelievable technique to enhance a pixelated image, or to recover some lossy data. In this lab, you're going to do something similar—this time your objective is to use linear regression to recover or 'fill out' a completely deleted portion of an audio file!



To complete this lab, you will be using The FSDD, Free-Spoken-Digits-Dataset, an audio dataset put together by Zohar Jackson once he noticed there weren't very many cleaned up audio (no dead-space, roughly same length, same bitrate, same samples-per-second rate, etc) audio libraries ready for machine learning.

1. Load up the started code stored at Module5/**assignment10.py**. Read through all of it, including the attached links. There are a lot of gems we'd like you to pick up that are only covered in the labs and not covered in detail in the course reading material, so be sure to make the most of it.
2. There is a variable called Provided_Portion, which is the percentage of the audio clip you'd like to keep. Everything else will be deleted. It's currently set to 25%, so leave it there until you've completed

and submitted the assignment; then you can experiment with it.

3. Load up 50 sample recordings per specification in the lab file.
4. Manipulate the dataset to prepare it for multi-output, linear regression by removing one of the images from the training set to use it as an independent testing sound. Then keep only Provided_Portion percent of the audio samples from the sound, discarding the rest.
5. Save the generated sound file, listen to it, check its R^2 score, then answer the lab question.

Note: Here is a good note from SciKit-Learn's documentation on multi-output problems.

Lab Questions

(1/1 point)
What are the reported R^2 score for the generated audio file?

- Greater than 0.75
- Between 0.50 and 0.75
- Between 0.25 and 0.50
- Between 0.05 and 0.25
- Less than 0.05 ✔

EXPLANATION

Unfortunately, even the linear regression algorithm knew how poorly it did. It's goal was to extrapolate more than three times further than the range of the training data. Linear regression really isn't the best algorithm to use for this type of work, but even so, the audio file produced is clearly distinguishable, although it sounds a little compressed and like a few people are talking simultaneously.

You have used 2 of 2 submissions