

Math 320 Extra Credit Programming Project - Fall 2025

Due date: Monday, December 1

Credit will count towards total course percentage grade, for a maximum of 2% extra credit.

In this lab assignment you will follow a Google/Assembly-AI project based on a web tutorial (which is in turn based on a written Google tutorial), which implements an automated speech recognition neural network. You will use Python and TensorFlow to code and train the neural network on your local machine. The final model should be saved and run on your machine so that you can use the voice commands in the limited set to move the “turtle” on screen.

Some important links:

- Link to the YouTube video: <https://www.youtube.com/watch?v=m-JzldXm9bQ>
- Link to the Google project: https://www.tensorflow.org/tutorials/audio/simple_audio
- Link to blog about Launching the Speech Commands Dataset:
<https://ai.googleblog.com/2017/08/launching-speech-commands-dataset.html>
- Link to book on Speech and Language Processing by Jurafsky (see chapter 16):
<https://web.stanford.edu/~jurafsky/slp3/>
- Audio Processing (good for recording with python to wav file) Tutorial:
https://www.youtube.com/watch?v=n2FKsPt83_A&t=960s
- Generating music in the waveform domain (interesting blog about generative music)
<https://sander.ai/2020/03/24/audio-generation.html>

Additional Features (Required):

- put a beep to indicate time to begin recording new voice command
- use dataset command “yes” to move the turtle back to its starting position

Extra Features (Not Required):

- record a new voice command “jump”, add to dataset, use recognition of jump to do the previous voice command twice.
- record a new voice command “back”, add to dataset, use recognition of back to do the opposite of the previous voice command.