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# What? <Digital Piano with scales implemented>

My program makes an interactive keyboard that only plays notes in a key that the user specifies. The user can also turn off this feature and play any note.

# Brief user instructions

There are 5 .py files, one .xlsx file, one .txt file and one folder which all need to be in the same directory.

The folder called ‘sample’ should contain 36 .wav files

‘Turtle\_Piano.py’ is the only file you need to open and run and then follow the directions on the screen. Read the text on the turtle window when it opens up and try the different modes. Make sure you can see the whole keyboard and read all the instructions below the keyboard.

# How it works

The code uses dictionaries and some maths to find the notes in different scales. It then uses basic if statements to only allow the notes in the specific scale to play. The code uses the ‘turtle.onkey()’ function to play different notes when the user presses a certain key on the keyboard. I use pygame.mixer() to play the .wav files.

## Data structures

I convert a excel sheet to a data frame then I turn that data frame into a dictionary.

This program uses a lot of dictionaries.

Boolean values are also used in the final program file to change the playing mode of the piano

## Interesting / tricky / subtle aspects of the code meriting further explanation

A tricky part of this was to get the notes in the scale because there was sometimes a rounding error using the equation.

# Particular challenges I overcame

Finding a database containing individual piano notes was a challenge. Originally my code made a sound file for every note on the piano but they didn’t sound as nice as the recorded piano notes.