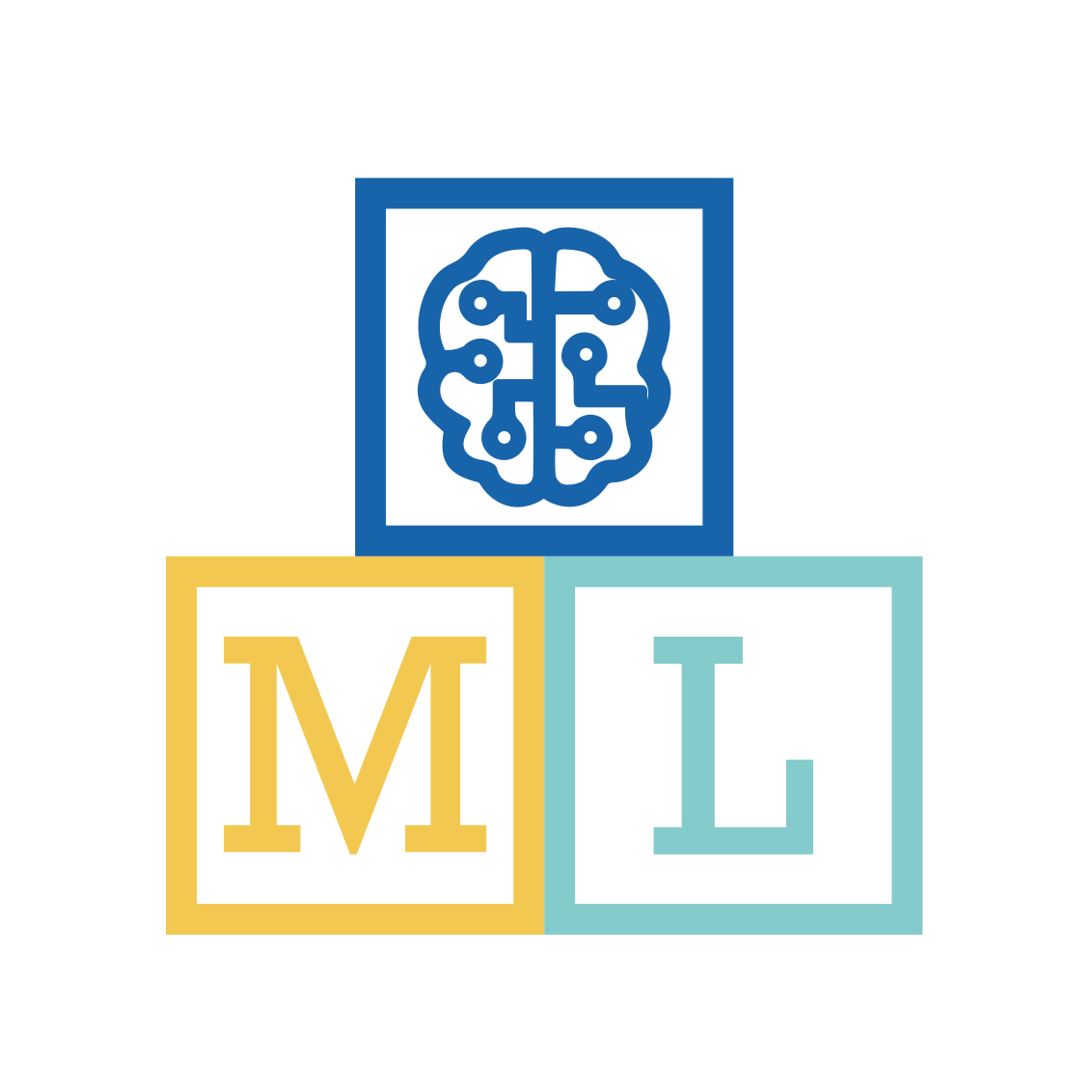
Voice Tuner



In this project you will use a machine learning model to recognise what note you are singing.

A screenshot of a computer

Description automatically generated

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1. Go to [https://machinelearningforkids.co.uk/scratch](https://machinelearningforkids.co.uk/scratch/)
2. Click on “**Project templates**”
3. Click on “**Voice Tuner**” and wait for the project to download
4. Click on the **Green Flag**  
   *Scratch will choose a random musical note and play it to you.  
   Your goal will be to hum or sing that note.*A screenshot of a computer

   Description automatically generated
5. *If you want to see how the random note is being chosen and played, look at the code in the* **target***sprite*
6. Click on the **measure** sprite  
   A screenshot of a computer

   Description automatically generated
7. Create this code, so Scratch will start listening to your humming and singing when you press the **M** key on your keyboard  
   *You can pick a different key if you like. I chose “M” for “Music”.*A yellow and green rectangular shapes with white text

   Description automatically generated
8. Create this code   
   *You don’t need to add the comments.   
   The comments are in the screenshot to help you understand the code.*A screenshot of a chat

   Description automatically generated
9. Give it a try!   
   *Click the Green Flag to choose a new note and hear what it sounds like.  
   Press the* **M** *key to start Scratch listening. Try to hum or sing the note.*
10. **How many** recordings of people’s voices do you think were collected to train this model?   
    **How** do you think the recordings were collected?  
    *Try to guess before you move on to the next step.   
    Write down your guesses to help you remember.*
11. In a new web browser window, go to [**https://ibm.biz/spiceml**](https://ibm.biz/spiceml)   
    *When we use a machine learning system, it is helpful if the creators of the system publish the “Model card” – where they tell you how it was created.  
    The model you have been using is* ***SPICE****.   
    This web page has the model card for this machine learning model.*
12. Have a look at the model card  
    *Model cards are complicated, so don’t worry that you won’t understand all of it. But there are some interesting things to find here.*   
     *For example, here are the names of the people who first created it.  
      
    A screenshot of a computer

    Description automatically generated*  
    *This is telling you that the model has been trained to recognise the note from the sound of a single voice, without background music.*   
      
    *This says how the model was trained, and what training data was used.*  
      
    *A screenshot of a computer

    Description automatically generated*  
    *You can find information about the MIR-1k training set at* [*https://paperswithcode.com/dataset/mir-1k*](https://paperswithcode.com/dataset/mir-1k)  
      
    A screenshot of a computer

    Description automatically generated  
      
    *This tells you that MIR-1k contains* ***one thousand recordings*** *of computing researchers singing Chinese songs in a karaoke!   
      
    Compare that with your guess. Were you close?*

**What have you done?**

You’ve been using a machine learning model to estimate the pitch of a human voice.

You’ve learned what a “model card” is. Not all artificial intelligence systems publish a model card, but it is a good practice that encourages transparency.

You have seen one way that the training sets needed to create real-world machine learning models are collected.

**What else could you make with this machine learning model?**

**Ideas and Extensions**

Now that you’ve finished, why not give one of these ideas a try?

Or come up with one of your own?