# IS310 Python Project

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## Introduction

The chosen problem domain is Music Production. The chosen problem lies in the common experience of music producers having unbalanced drum sample libraries. Due to this unbalance, producers will often spend money on new sample packs because they are unaware of the breadth of their current library, and where it might need additional samples to make it more well-rounded. Our project aims to identify the current makeup of a given drum sample library, and provide an easy-to-understand visual that helps producers have a better understanding of their sample library makeup in order to make better purchasing decisions.

## Methods

Our methodology uses python and additional libraries to sort through an existing database of sound files to analyze and classify these sounds in common understanding, and then generate an visual to show the difference between the amount of sound types a certain database has.

## Solutions

First, use the Librosa, Numpy, and matplotlib python libraries to sort through a chosen windows folder, as well all its subfolders and collecting any .wav and .mp3 files within. Once the files are collected, the program analyses these files’ mfccs (timbre), centroids (brightness), chromas (pitch), and zero-crossing rates (purity) in order to sort them into a predetermined classification. The chosen classifications are Kicks, Snares, Hihats, Cymbals, Toms, and Clicks. These are standard percussion classifications commonly used by producers, and generally, they coincide with the parts of a standard drum kit.

Next, Once the audio files are gathered and sorted, we will use the matplotlib library to generate a pie chart to express the ratios between the different class collections and their sizes. Finally, the program will output text which explains the results of the pie chart, and where a producer should consider expanding their sample library to be more well-rounded.

## Conclusions

In Conclusion, the program accomplished its goal, and the graph was displayed, giving the user the necessary information. Notes include that the control files used in the program come from our own sample libraries, and may be based more on hip-hop drum samples than an average kit.