**Shazam’s Music Recognition Algorithm**

Objective:

Shazam is an application that can identify music based on a short sample played to the microphone of a device. The aim of this project is to replicate Shazam’s music recognition algorithm.

The Shazam Algorithm:

Shazam recognizes the music that is being played by recording a 10 second clip of it and running it against its vast database of songs and returning the closest matches. The genius of the shazam algorithm is in the manner in which it stores its songs. The original audio file is processed. The algorithm employs fast fourier transforms to convert the audio clip from the time domain to the frequency domain. Once the frequency makeup of the song is known, the fingerprinting of the song is done by identifying frequencies of higher importance. This becomes the signature of the song. This signature is the key in the hash table. The value corresponding to the key is the time at which the frequencies appear and the song and artist. For the recognition aspect, a sample recording of the song is recorded. The sample goes through a similar process of fingerprinting as above. It is checked against the hash table and the most likely matches are returned.

Project Plan:

Part 1:

* Capture the song (analogue signals)
* Convert from time domain to frequency domain using fast fourier transforms (using the Cooley-Tukey Algorithm, a divide and conquer which solves the problem in O(nlogn) time)
* Fingerprinting (frequencies with highest magnitude(peaks) are selected for this purpose)
* Store hash values in a database

Part 2:

* Compare the hash value of the captured song with the ones in the database to recognize the song