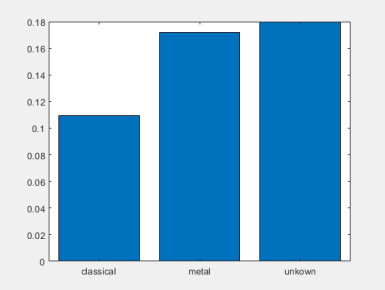
1 3rd Assignment

1.1 ZCR

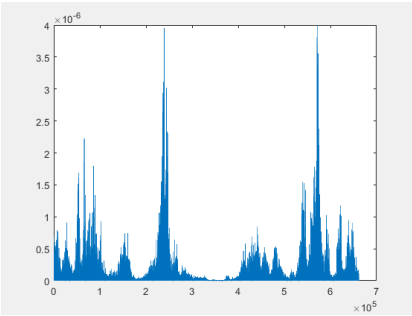
In the 3rd assignment 3rd exercise was to extract features from 2 different kind of songs a Classical and a Metal wave file. The first feature which extracted was the zero crossing rate, which indicates the rate that signal changes from positive to negative the corresponding feature has been widely used for speed recognition [2].

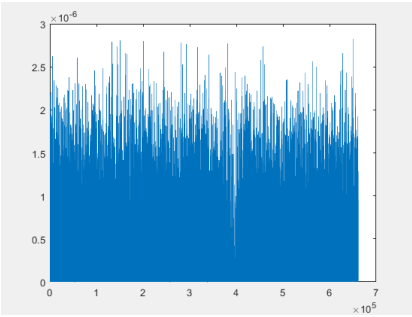


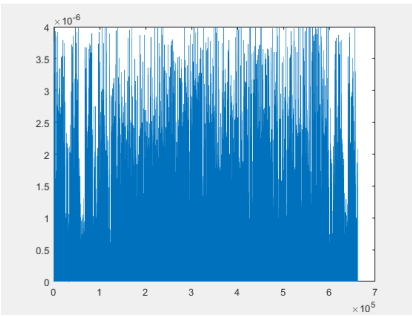
1.2 Energy

The next feature which was extracted from the two signals was the energy. It is highly common feature which has been used to classify audio signals. It the correspind experiment is very efficient feature. But the total energy of the two signals is really low number and cannot be taken in consideration as a very good feature for our purpose.

AudioFile	Sum Energy
Classical	3.316730495445949e-10
Metal	5.298010874939107e-09
Unkown	1.030626791771545e-08





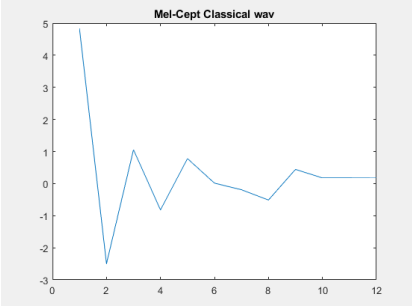


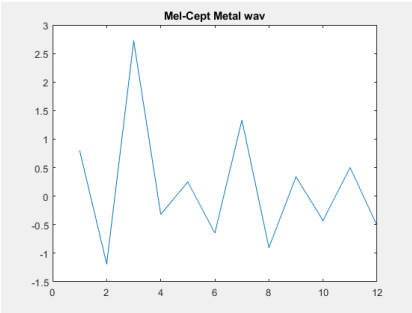
1.3 MFC

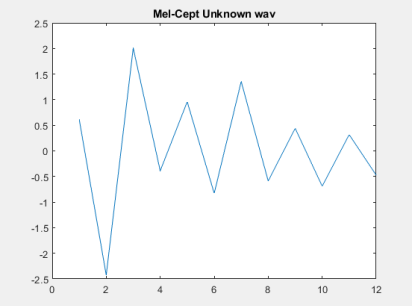
The mel-frequency-sceptrum represents discrete frequencies of a signal. The mel-frequency is bands equally separate and more close the human audio, which means that can represent audio more clear [1]. The corresponding feature has been used for speed recognition and has been show better results for support vector machine(SVM) and k-nearest-neighbors(K-NN).

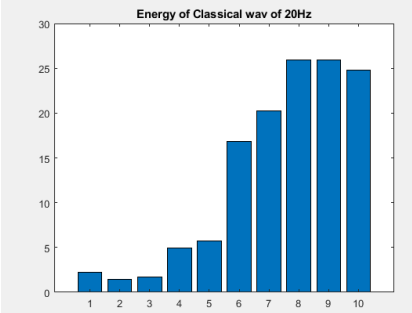
1.4 Energy of 10 bands for 20Khz

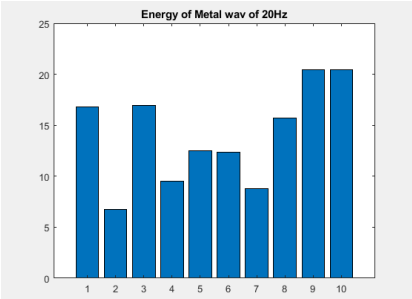
The next feature was the energy of a signal of the first 20Khz.

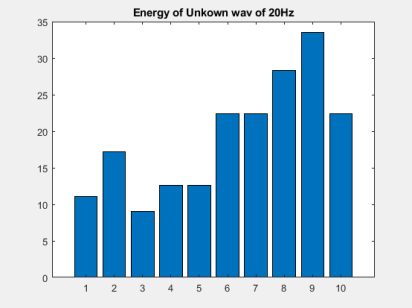












2 Conclusion

The distribution of the images depicts that the unknown wave is highly correlated with the meta song. It would classify as a metal song. The features that were extracted helped to classify the song except from the last feature which we can observe that the distribution is identical in the last bands

References

[1] A. Kumar, S. S. Rout, and V. Goel. Speech mel frequency cepstral coefficient feature classification using multi level support vector machine. In *2017 4th IEEE Uttar Pradesh Section International Conference on Electrical, Computer and Electronics (UPCON)*, pages 134–138, Oct 2017.

[2] Pratap Vikhe. Voice activity detection algorithm for speech recognition applications. 01 2011.