

The background features a dark teal triangle on the left side, pointing towards the center. The rest of the background is composed of various shades of teal and a bright yellow triangle at the top center, all arranged in a complex, overlapping geometric pattern.

# Music/Song Recognition

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# Tasks

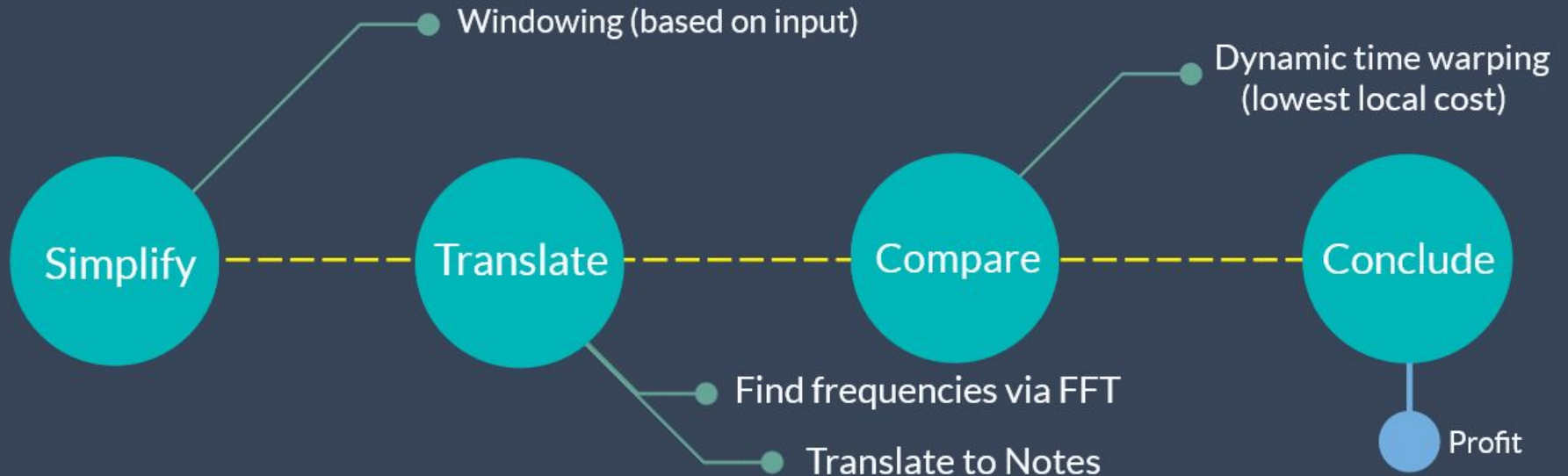
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- Receive monophonic music/sound source
- Process/Interpret signal to find fund. freq.
- Translate frequencies to notes (closest)
- Run final matrix against database to find correlations, and find the best match(es)



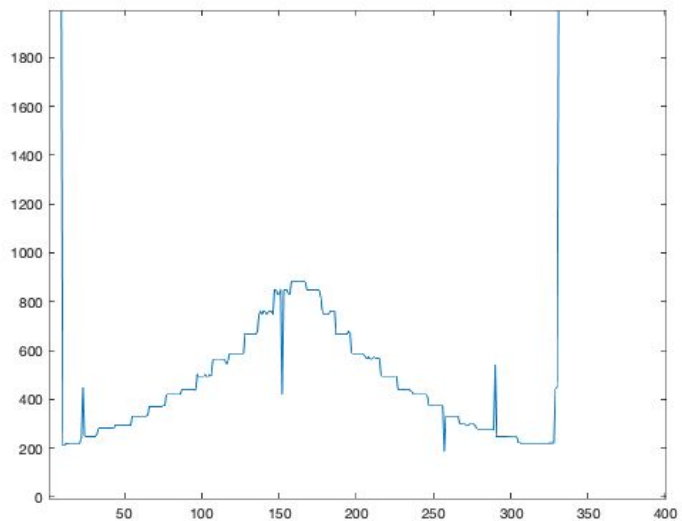
# Process

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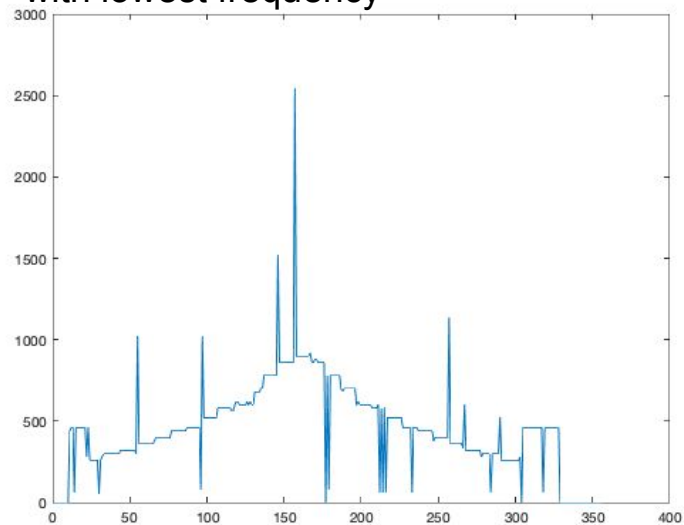


# Pitch() vs. find\_Fundamental()

Pitch(), Normalized Correlation Function

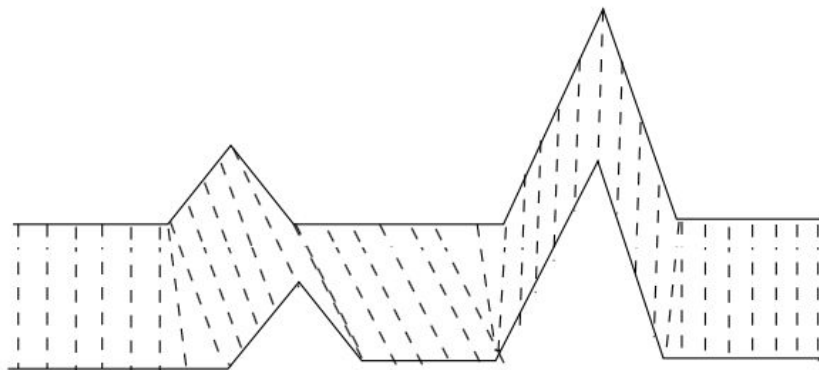


find\_Fundamental(), picking the peak with lowest frequency



# Identifying the Song

- Combine all songs into a large array.
- Label the song number of each sample/note.
- Shift the query/sample and operate dynamic time warping to find the closest match.



# Results

- Works well for arco and flowing melody.
- Not accurate enough for pizzicato queries.
- Robust in tempo change.
- Time consuming.

# Reference

- Atal, Bishnu Saroop. "Automatic speaker recognition based on pitch contours." *The Journal of the Acoustical Society of America* 52.6B (1972): 1687-1697.
- Wang, Avery. "The Shazam music recognition service." *Communications of the ACM* 49.8 (2006): 44-48.
- De Cheveigné, Alain, and Hideki Kawahara. "YIN, a fundamental frequency estimator for speech and music." *The Journal of the Acoustical Society of America* 111.4 (2002): 1917-1930.