Beethoven

Key Analysis with music21.

Hypothesis

Beethoven as a break-away from the classical period.

Limiting ourselves to basic tonal analysis, can we appreciate Bethoven as a break-away by analyzing how his works deviate from the standard norms at the time?

Approach

Data: 1518 midis (works) separated by composition category (sonatas, piano works, symphonies…)
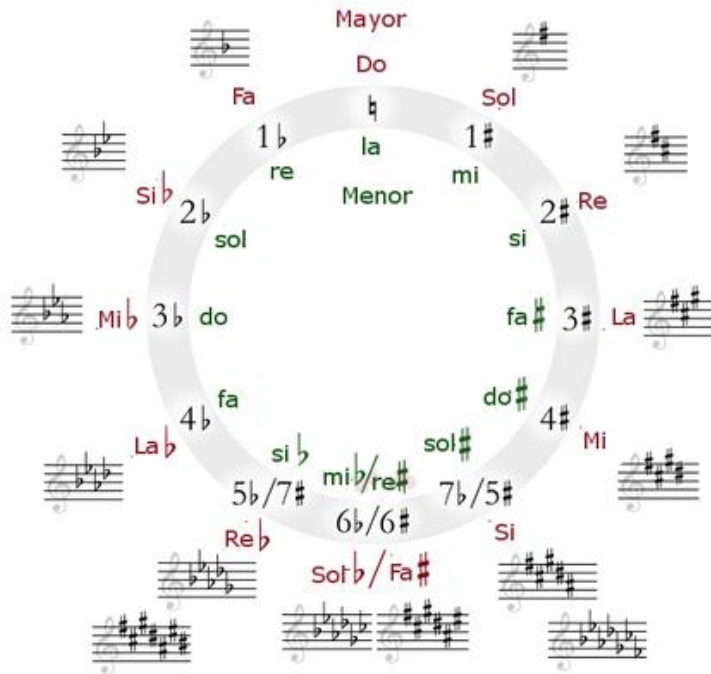
Tools: music21 python library for musical analysis.

Analysis:

-Key signature vs first and last chords (Deducible/Undeducible)

-Key density vs key deduced by key signature

-Rare Keys (6 or more sharps or flats)

-Major vs Minor works

Key and Key Signature

Circle of Fifths.

Sonate N° 8 en Do mineur
Opus 13 "Pathétique"
BEETHOVEN Ludwig van

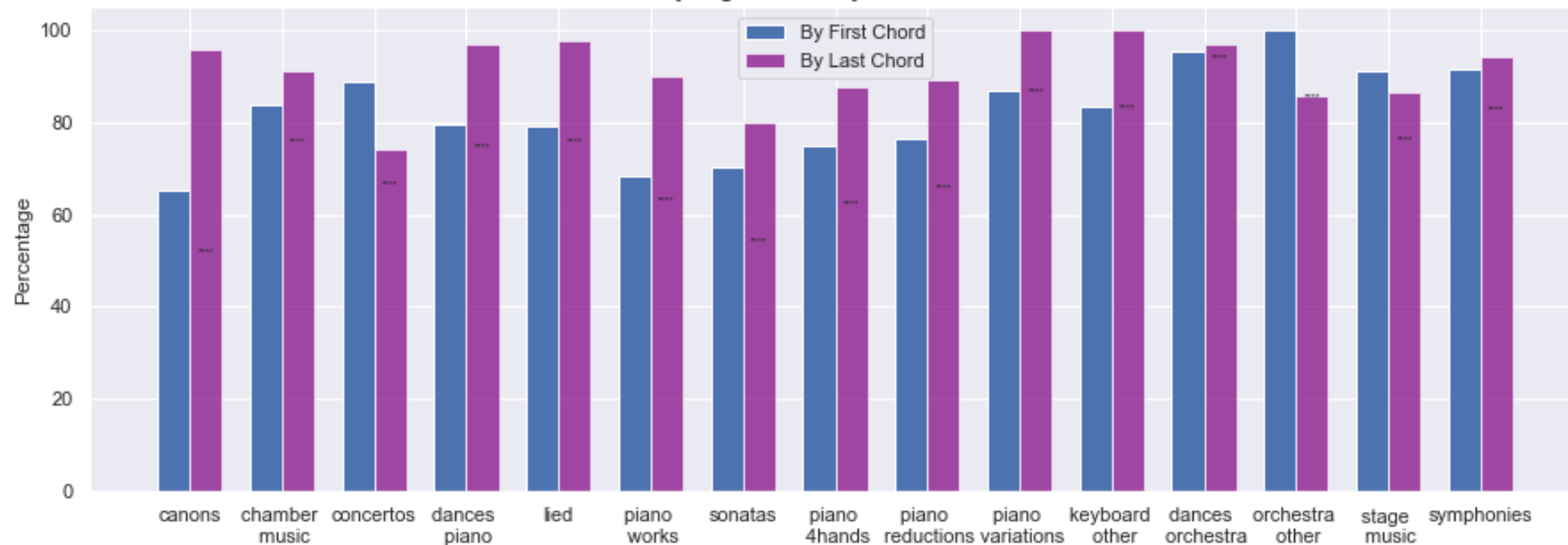**Key Signature**: E- mayor/ C minor

----

Tonics: E- / C

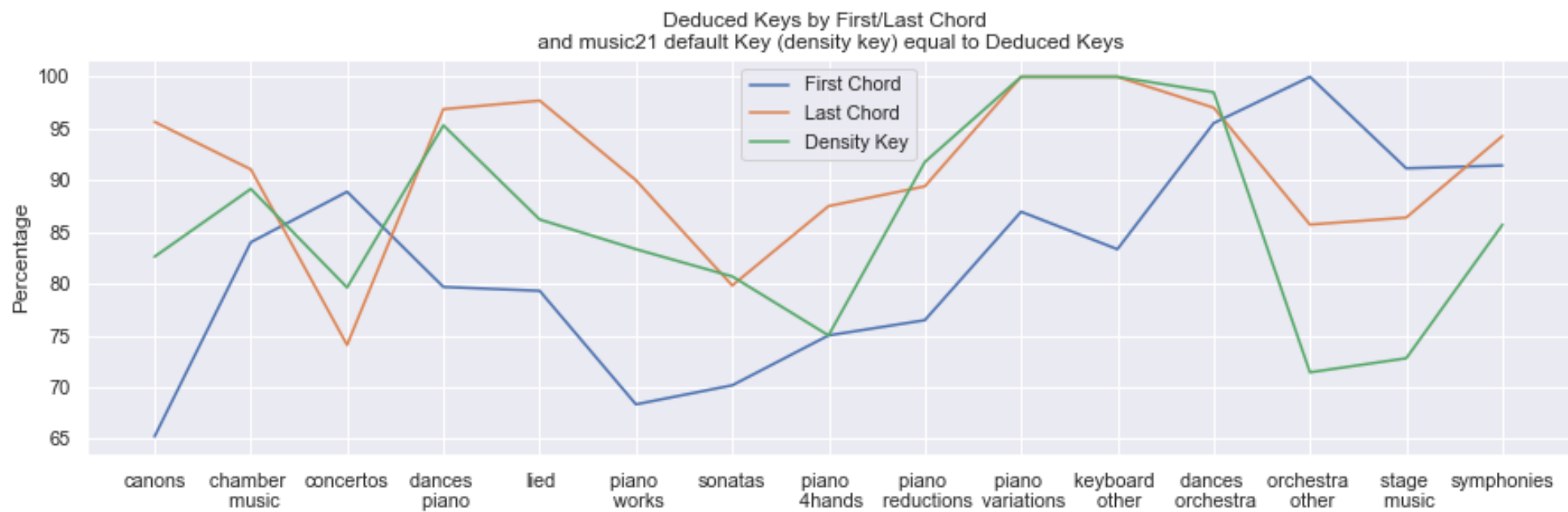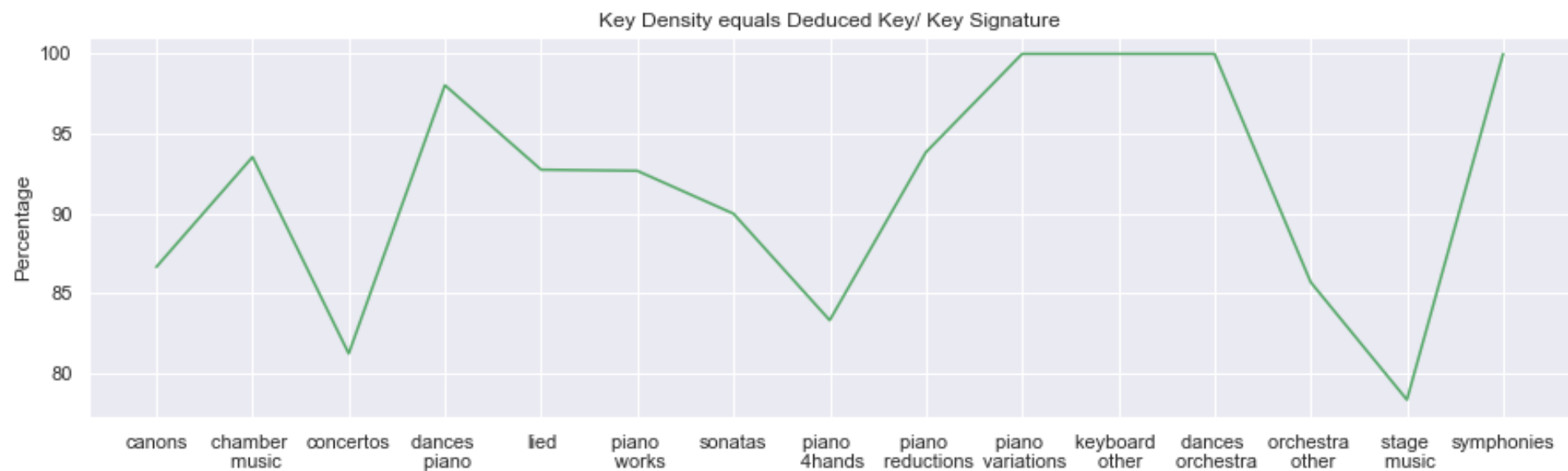**First Chord's Root**: C

Key: C minor

Key Signature's Tonic equal to First/Last Chord's Root
"Deducible Keys"
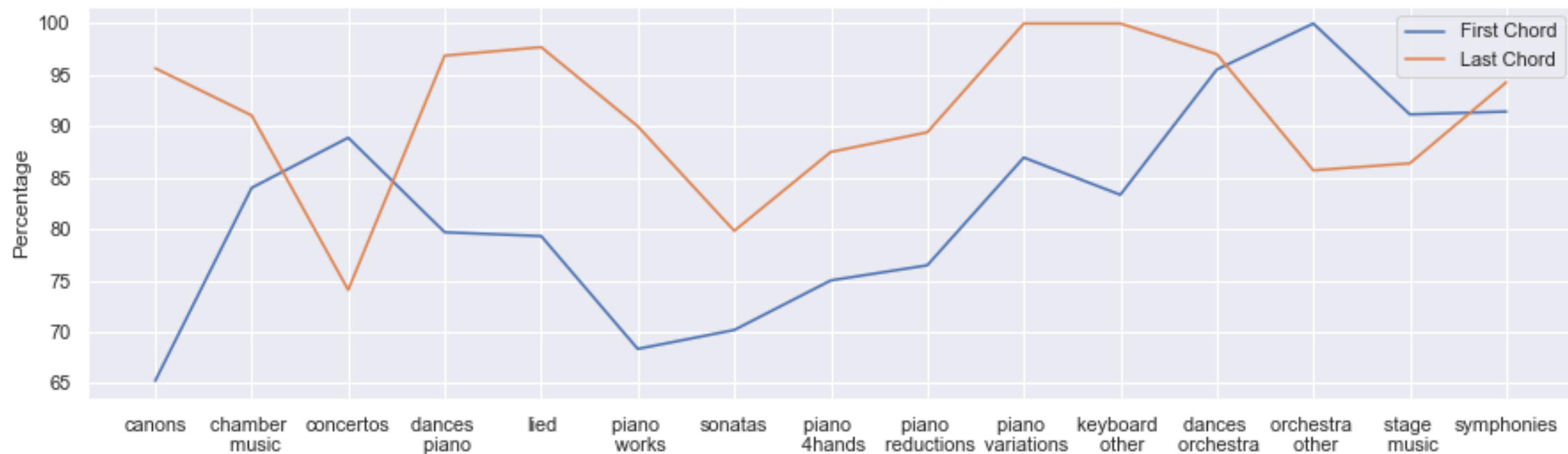
Deduced Key Signature's by First/Last Chord's Root

The mark on second bars indicate the percentage of keys deduced by first chord which are also deduced by the last chord.

Key Density equals Deduced Key/ Key Signature

Deduced Keys by First/Last Chord
and music21 default Key (density key) equal to Deduced Keys

Deduced Keys by First/Last Chord
and music21 default Key (density key) equal to Deduced Keys
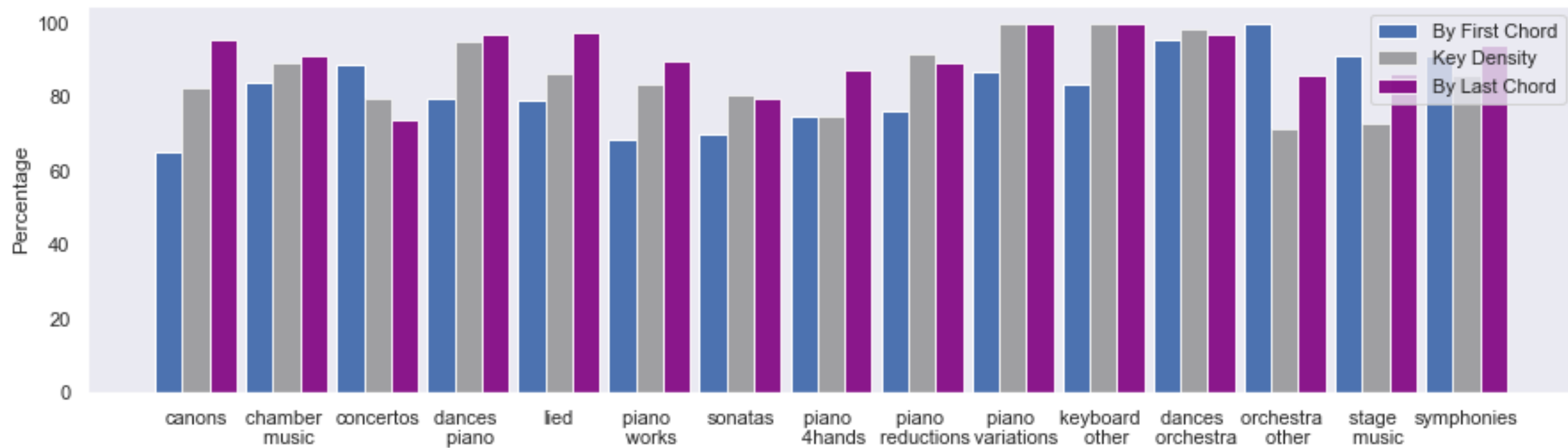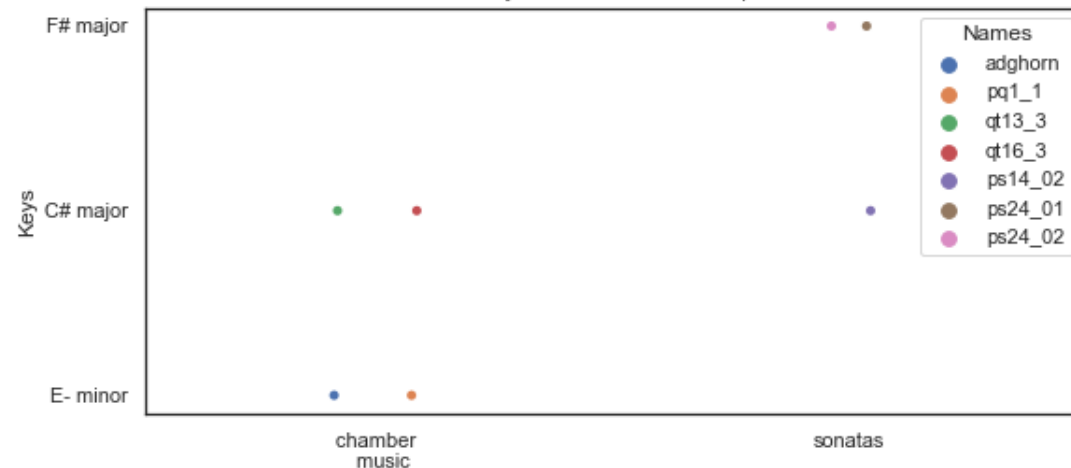
Number of Works per Tonality
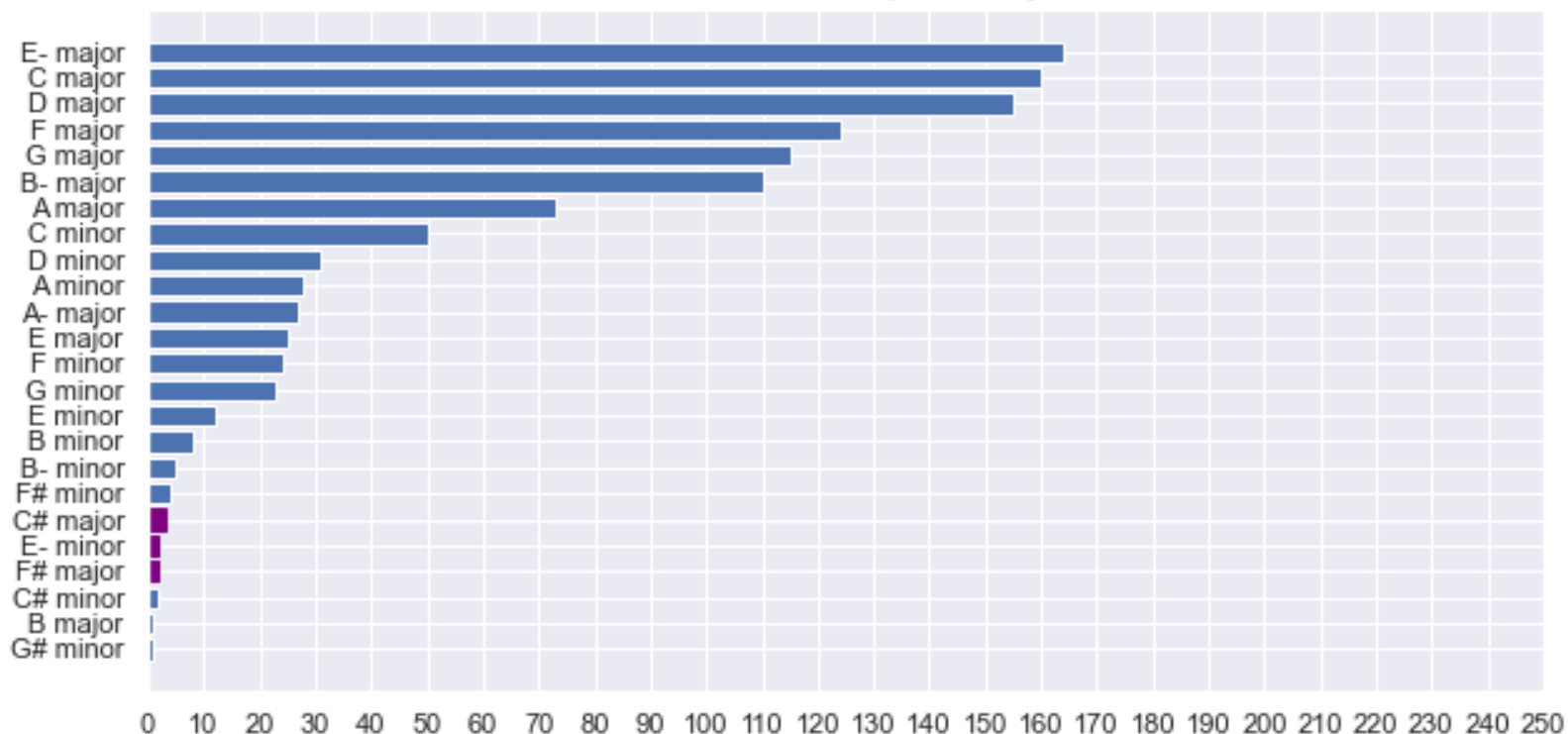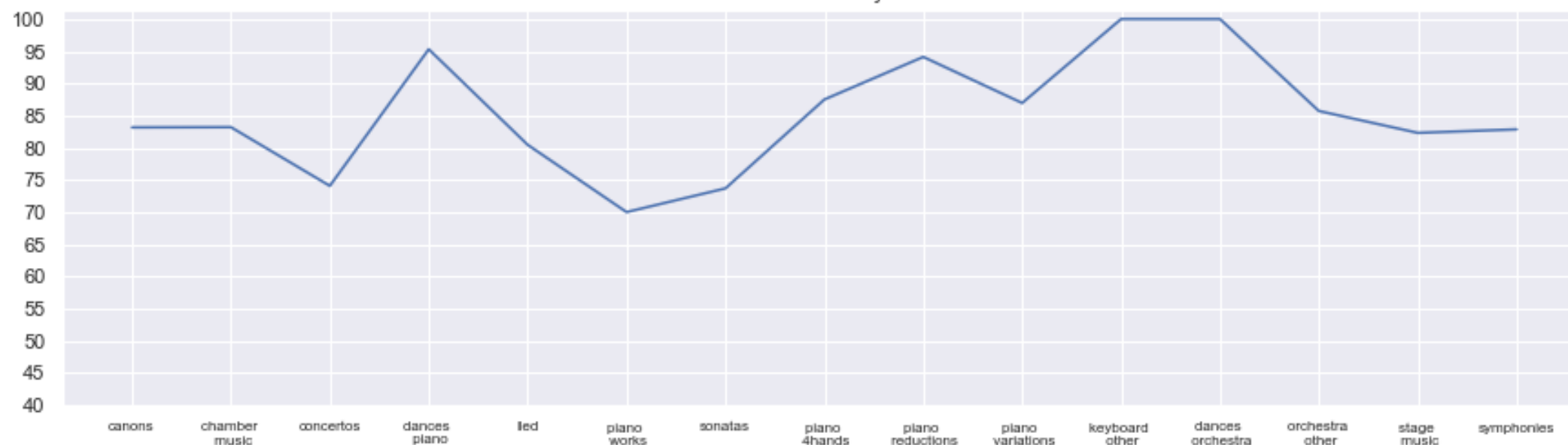
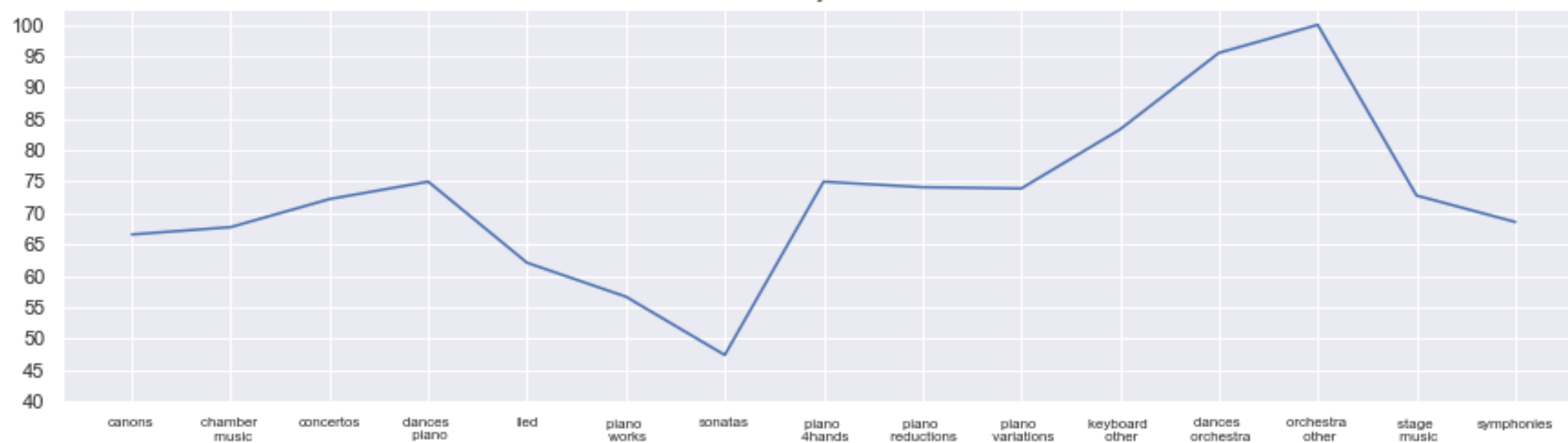C# major : 7
E- minor: 6
F# major: 6

Works in Key with more than 5 Sharps or Flats

Percentage of Works in Major Key
Default Key

Percentage of Works in Major Key
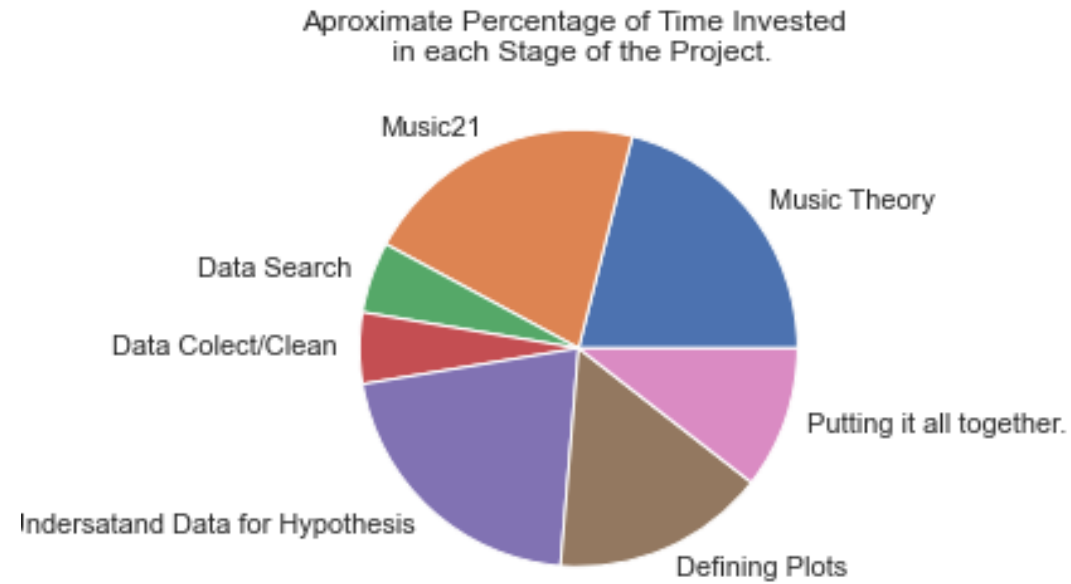Deduced Key if not Default

Conclusions

-Deviation from standard norms.

-Relative to contemporaries.

Assumptions:

-Key Signature (from midi files)

-Key density algorithm

AA

Aproximate Percentage of Time Invested
in each Stage of the Project.

Music21

Music Theory

Data Search

Data Colect/Clean

Putting it all together.

Indersatand Data for Hypothesis

Defining Plots

1)What would you change if you needed to do another EDA project?

2) What do you learn doing this project?