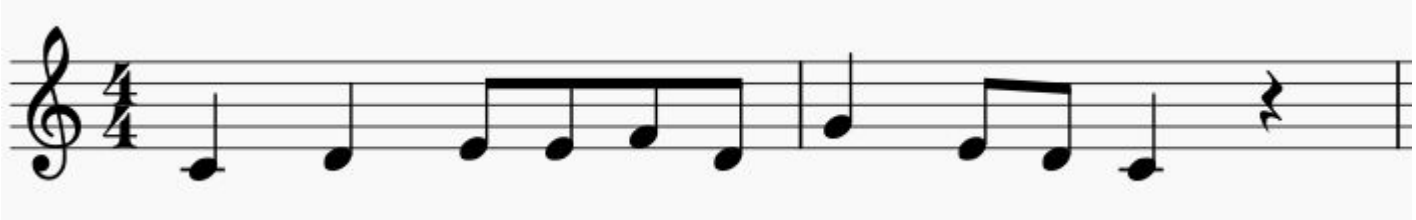
Music theory concepts for melody generation

Valerio Velardo

Melody

- Sequence of notes and rests



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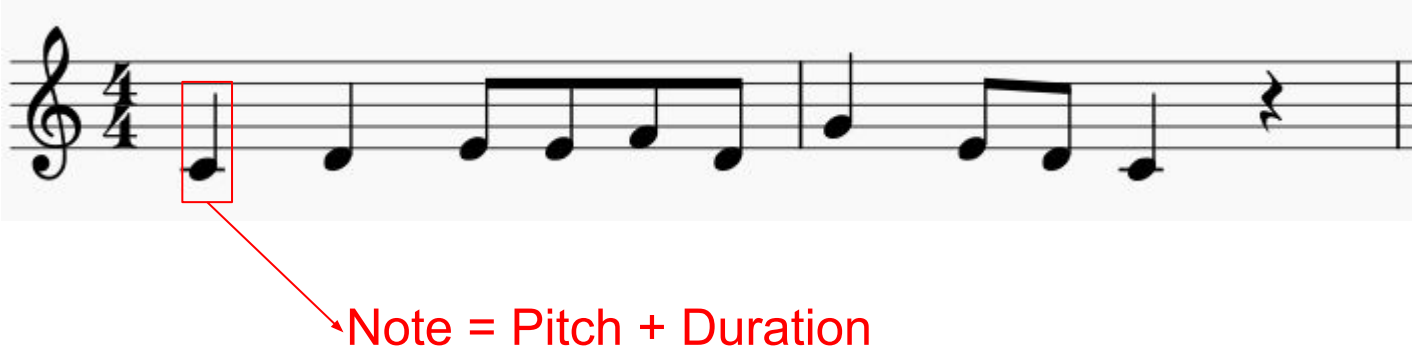

Pitch

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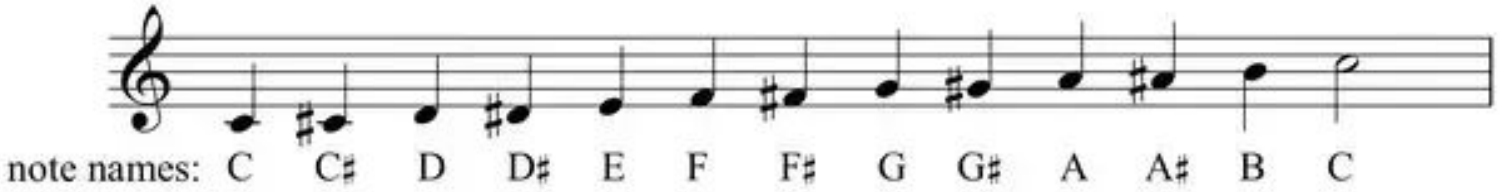

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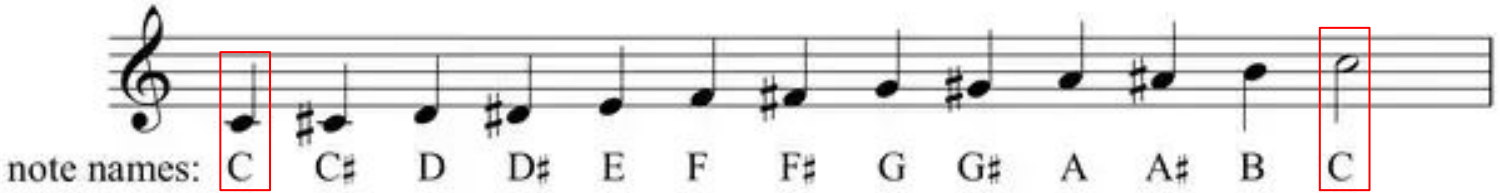

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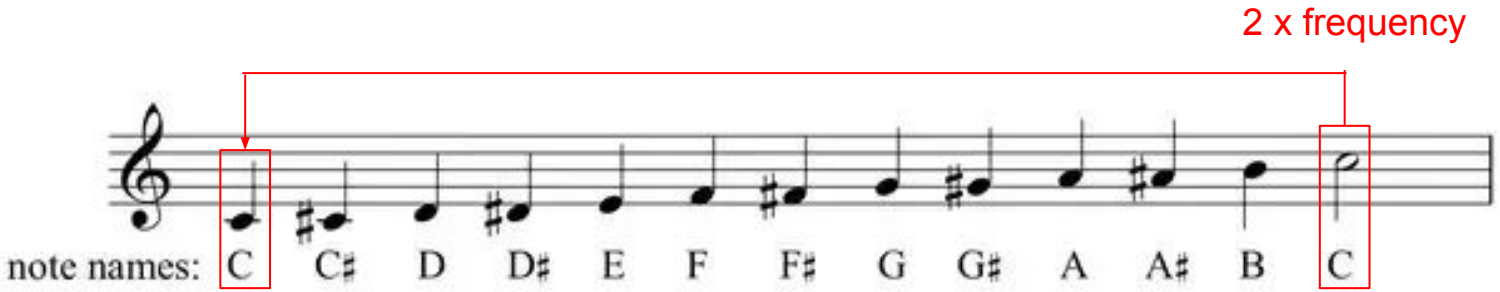

Scientific pitch notation

- Note name + octave
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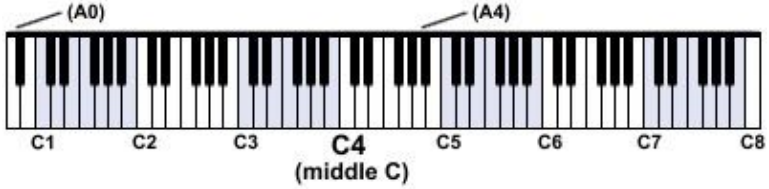
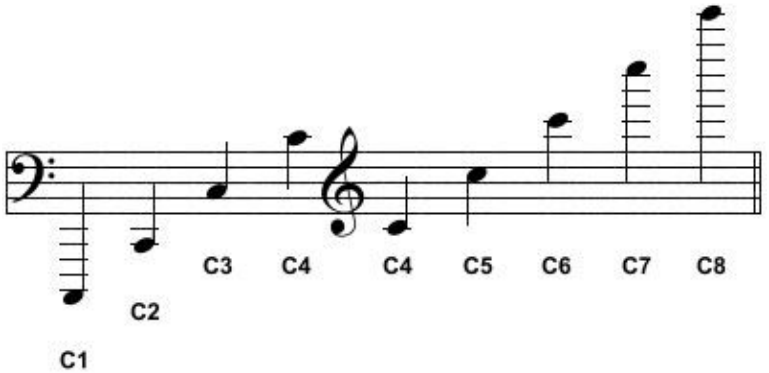
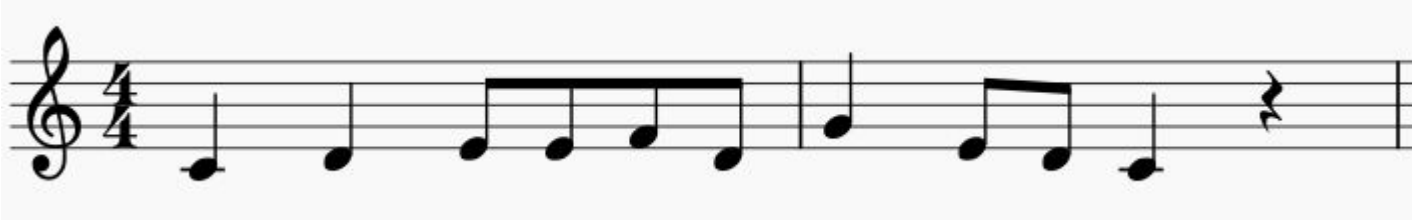




Melody



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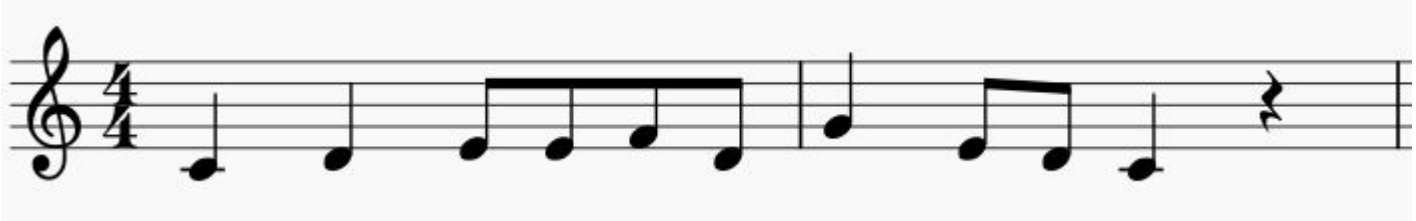

MIDI note notation

- MIDI is a protocol to play, edit and record music

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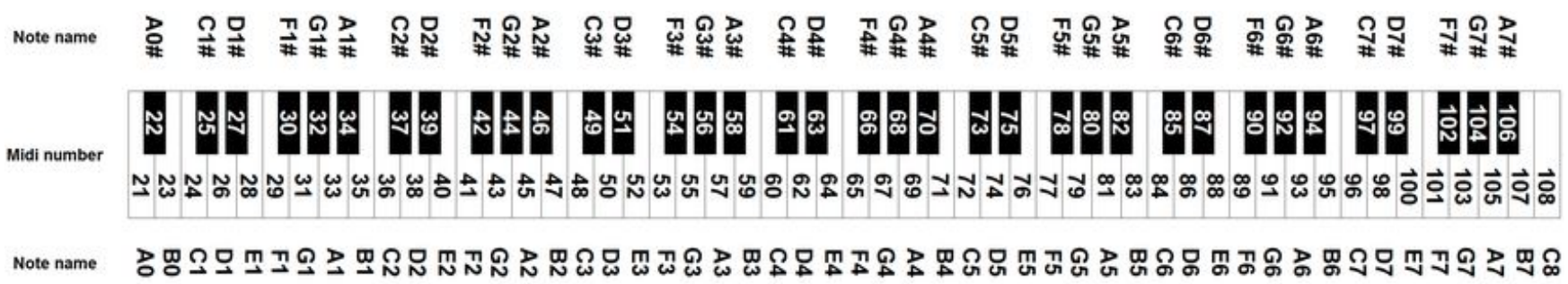
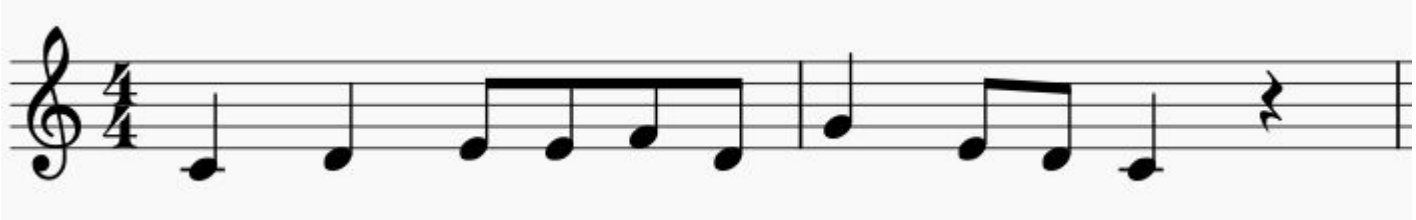
- Map note names to numbers
- C4 = 60

MIDI note notation



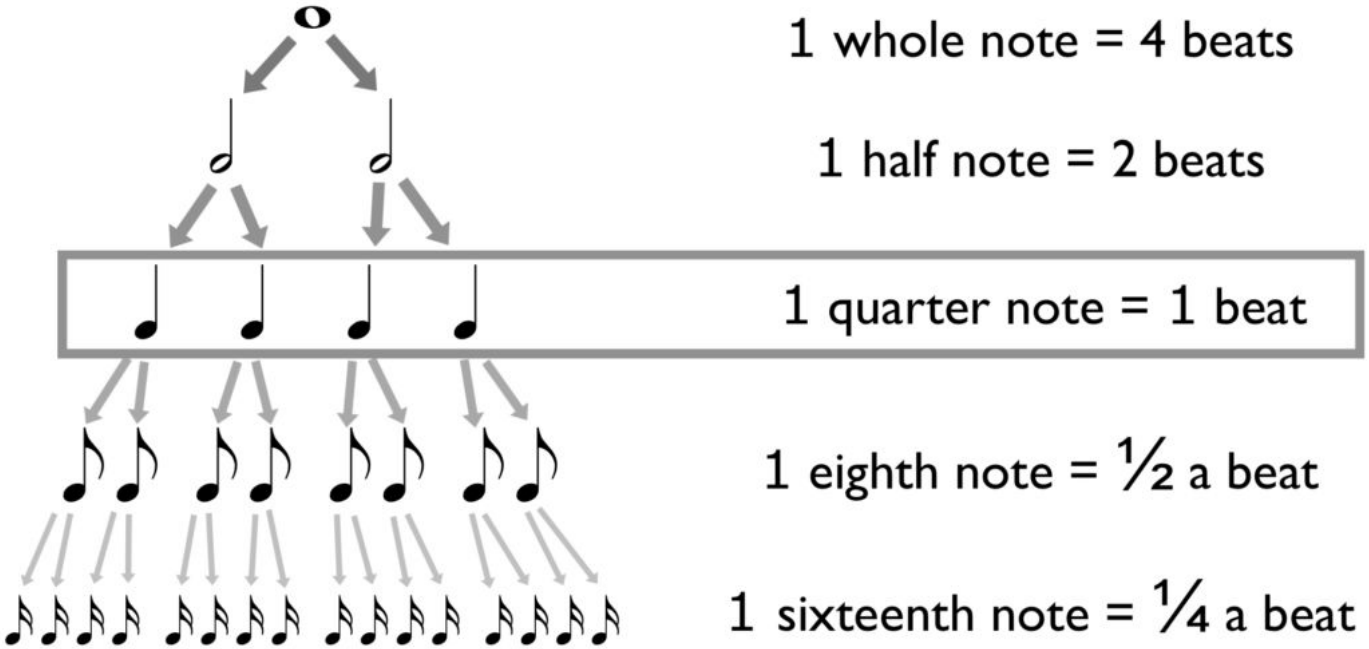
Melody



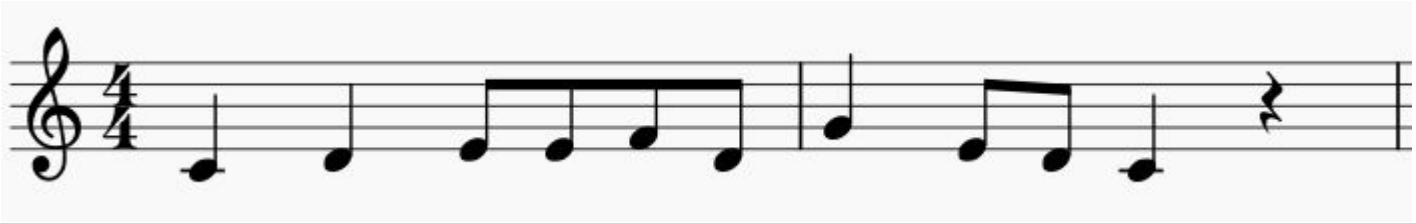
C4 D4 E4 E4 F4 D4 G4 E4 D4 C4

60 62 64 64 65 62 67 64 62 60

Note values


1 whole note = 4 beats
1 half note = 2 beats
1 quarter note = 1 beat
1 eighth note = ½ a beat
1 sixteenth note = ¼ a beat

Melody



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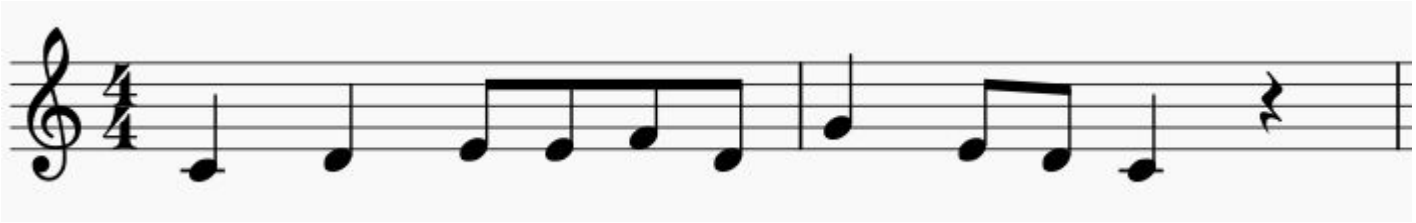
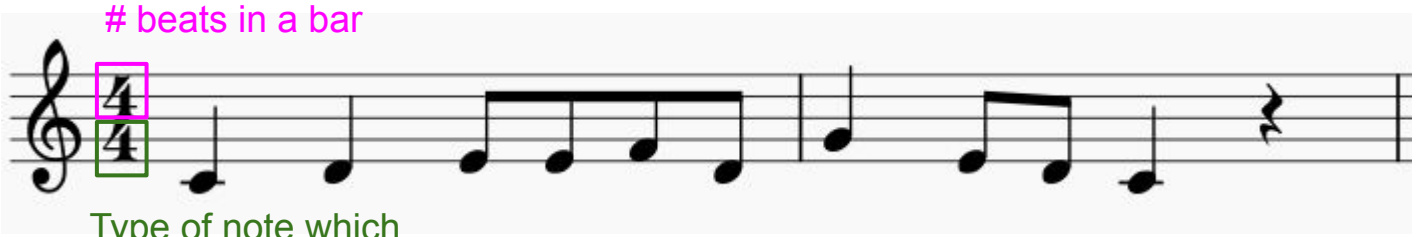


Duration in # beats: 4 4

Time signature



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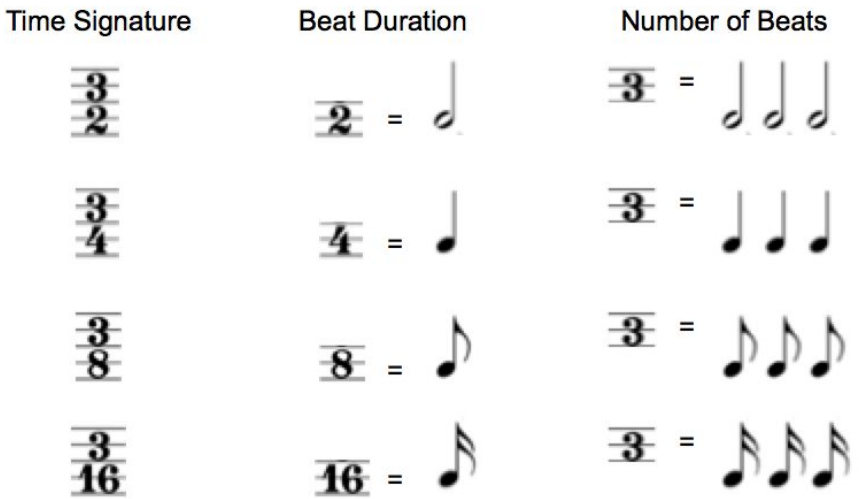

Key

- Group of pitches (i.e., *scale*) that forms the centre of a piece
- Tonic + mode
- E.g., C maj, D min

Tonic note

- Pitch that provides sense of arrival
- Centre of gravity
- Often found at the beginning/end of a piece

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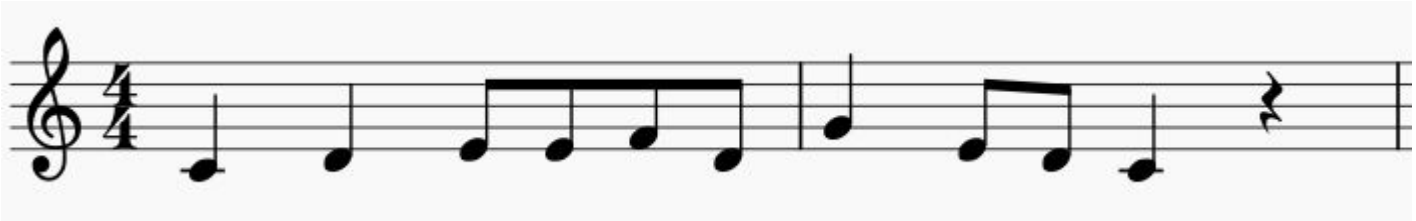

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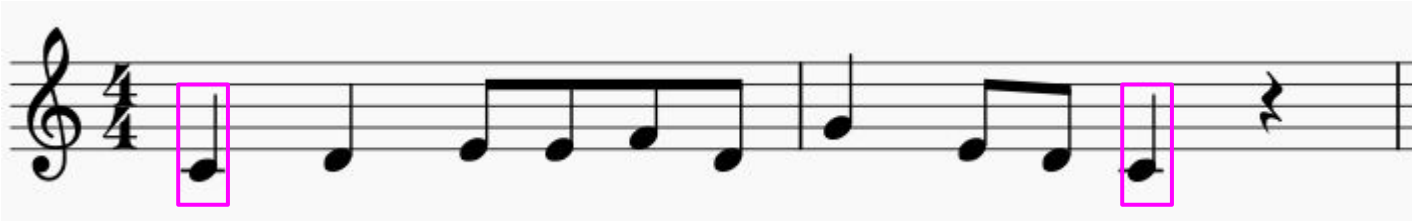
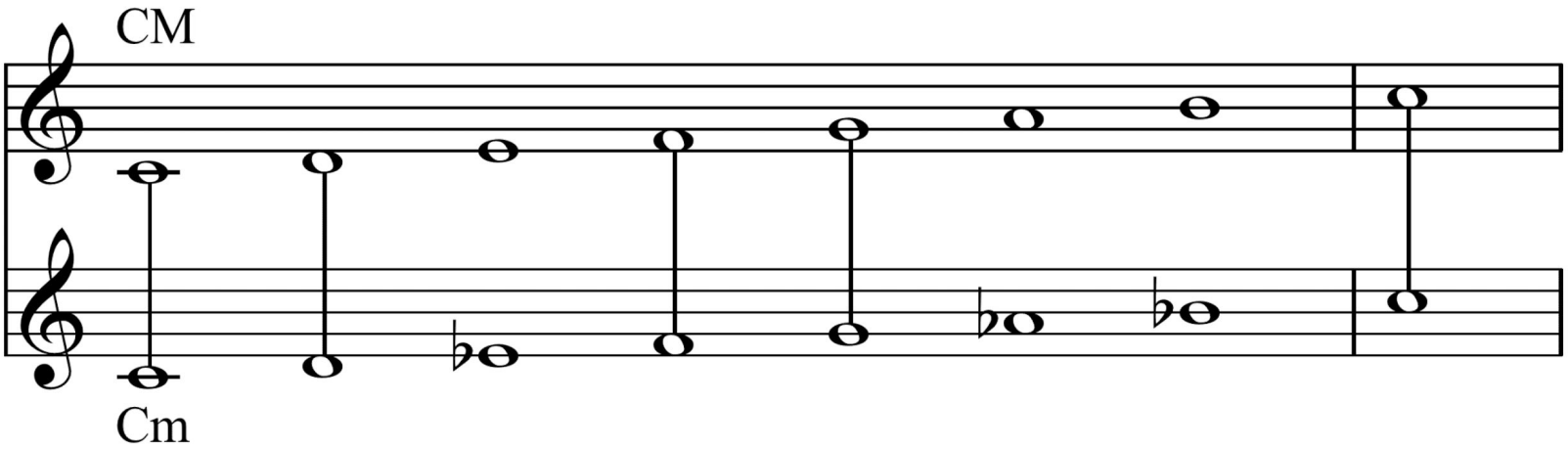


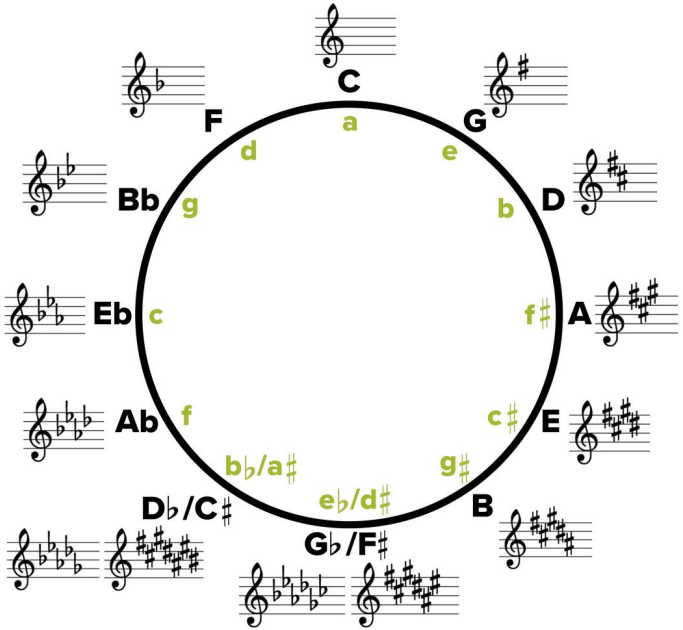
Major/minor scale



keys

12 notes x 2 modes = 24 keys

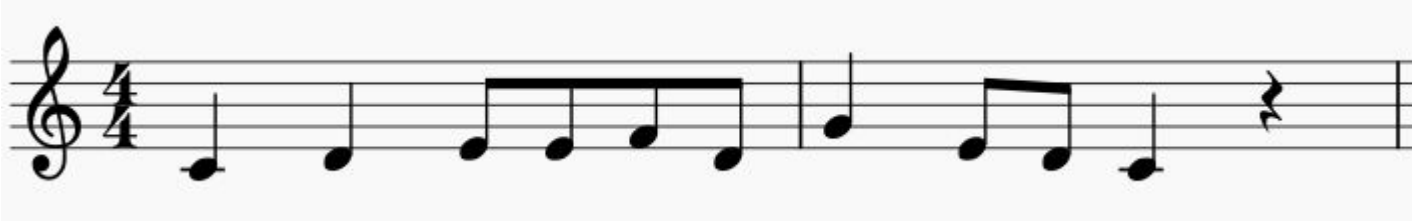
keys



Transposition

- Moving collection notes up/down by a given interval
- Change key
- Musical content remains the same

Music representation



Music representation: Idea 1

- Sequence
- Pitch/duration info for each note
- E.g., [(C4, 1), (D4, 1), ...]

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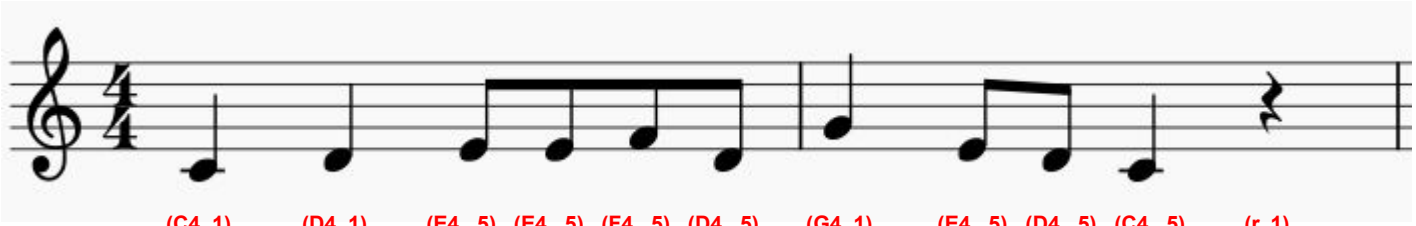

Music representation: Idea 2

- Time series
- Sample melody at each 16th note
- Each step = 16th note
- Log MIDI note when note occurs
- Use “_” symbol for held notes
- Use “r” symbol for rest

Time series representation: Example

- 4/4 time signature
- 16 samples per bar
- 4 samples per quarter note

Time series representation: Example

[“60”, “_”, “_”, “_”,

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[“60”, “_”, “_”, “_”,

“62”, “_”, “_”, “_”,

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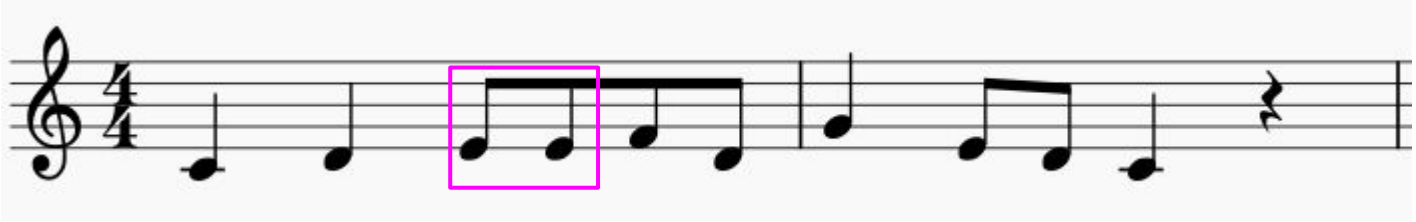


Time series representation: Example

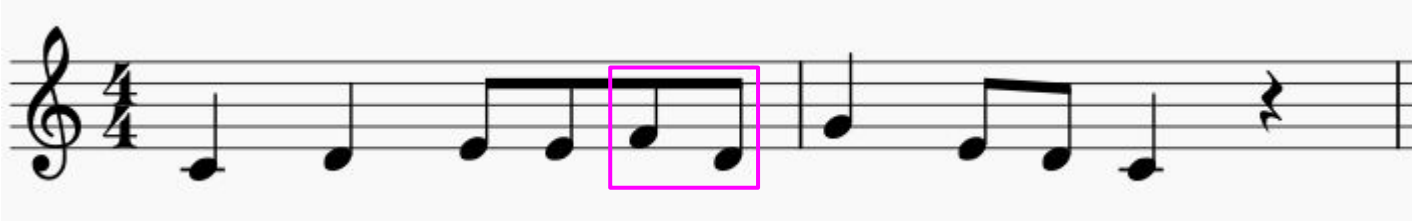
[“60”, “_”, “_”, “_”,

“62”, “_”, “_”, “_”,

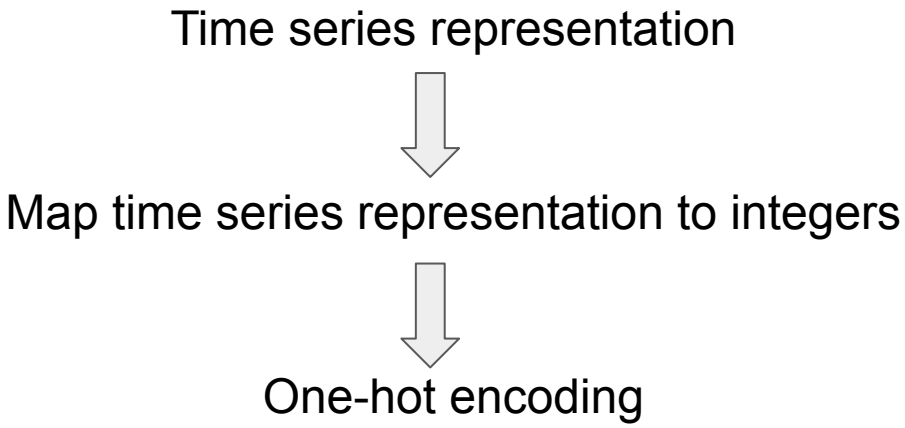
“64”, “_”, “64”, “_”,

“65”, “_”, “62”, “_”,

…]



Preparing melodies for LSTM ingestion



What next?

- Preprocess folk song dataset