

# Exercise Class Playlist

## Data Analysis

Lisa Siefker  
Data Mining SP24

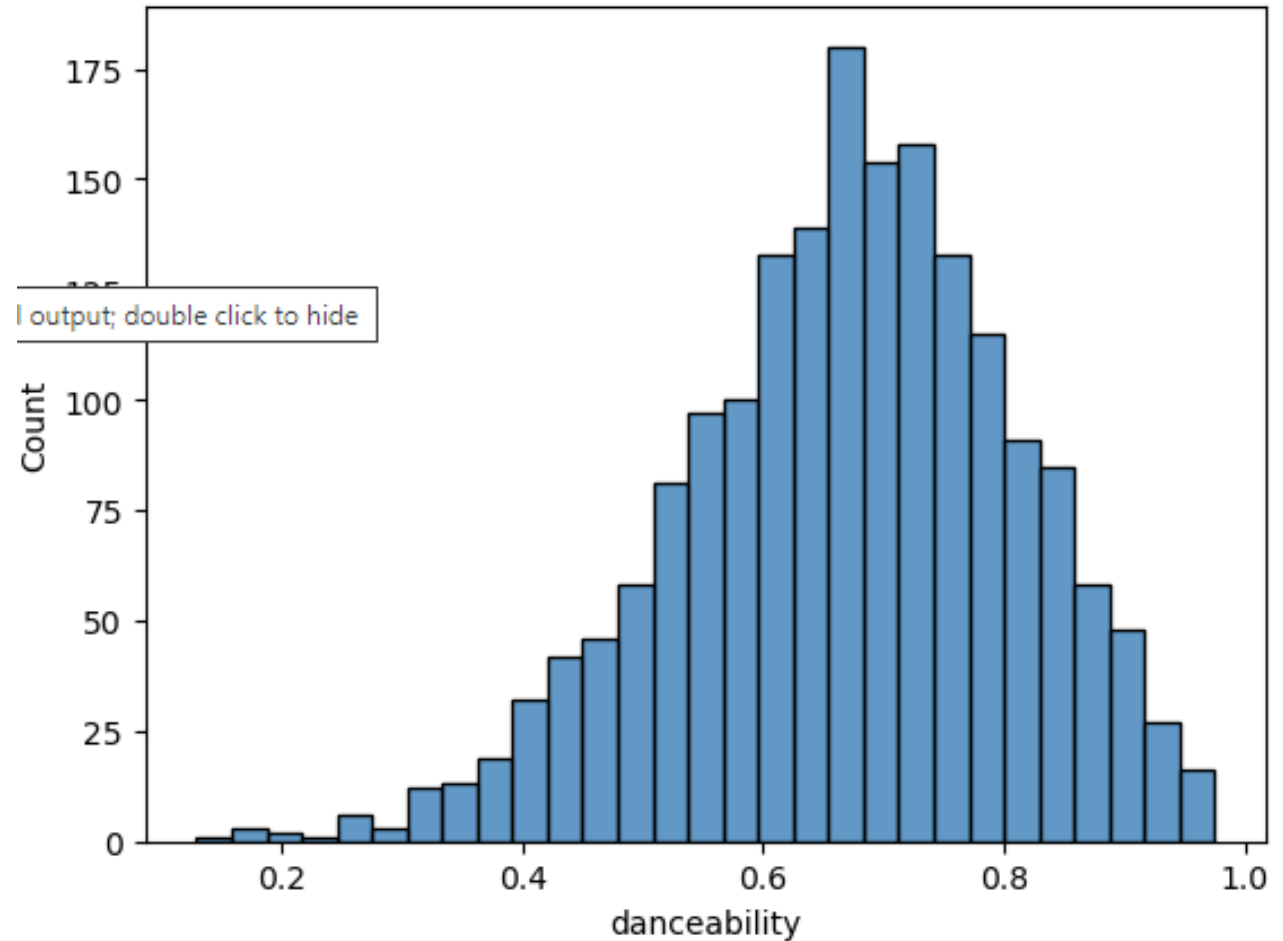


# Requirements

- **Most important: every song must be danceable**
- All music must be selected from the provided list of 2,000 songs (1,941 songs after removing duplicates)
- Songs with explicit lyrics may be included
- Three instructors (Molly, Piper, and Teddy) teach classes on a set schedule.  
Any songs selected must meet the preferences of each instructor
  - ✓ Molly prefers 2000s music
  - ✓ Piper prefers pop music
  - ✓ Teddy prefers hip hop music
- Each class lasts one hour and includes a 10-minute warm up and a 10-minute cool down
- The aerobic + strength classes include 20 minutes of aerobics and 20 minutes of strength training
- The aerobic classes include 40 minutes of aerobics

# Danceability

- A value of 0.0 is least danceable and 1.0 is most danceable
- Min danceability = 0.13
- Mean danceability = 0.67
- Max danceability = 0.98
- Songs w/danceability > 0.67 are 'danceable'

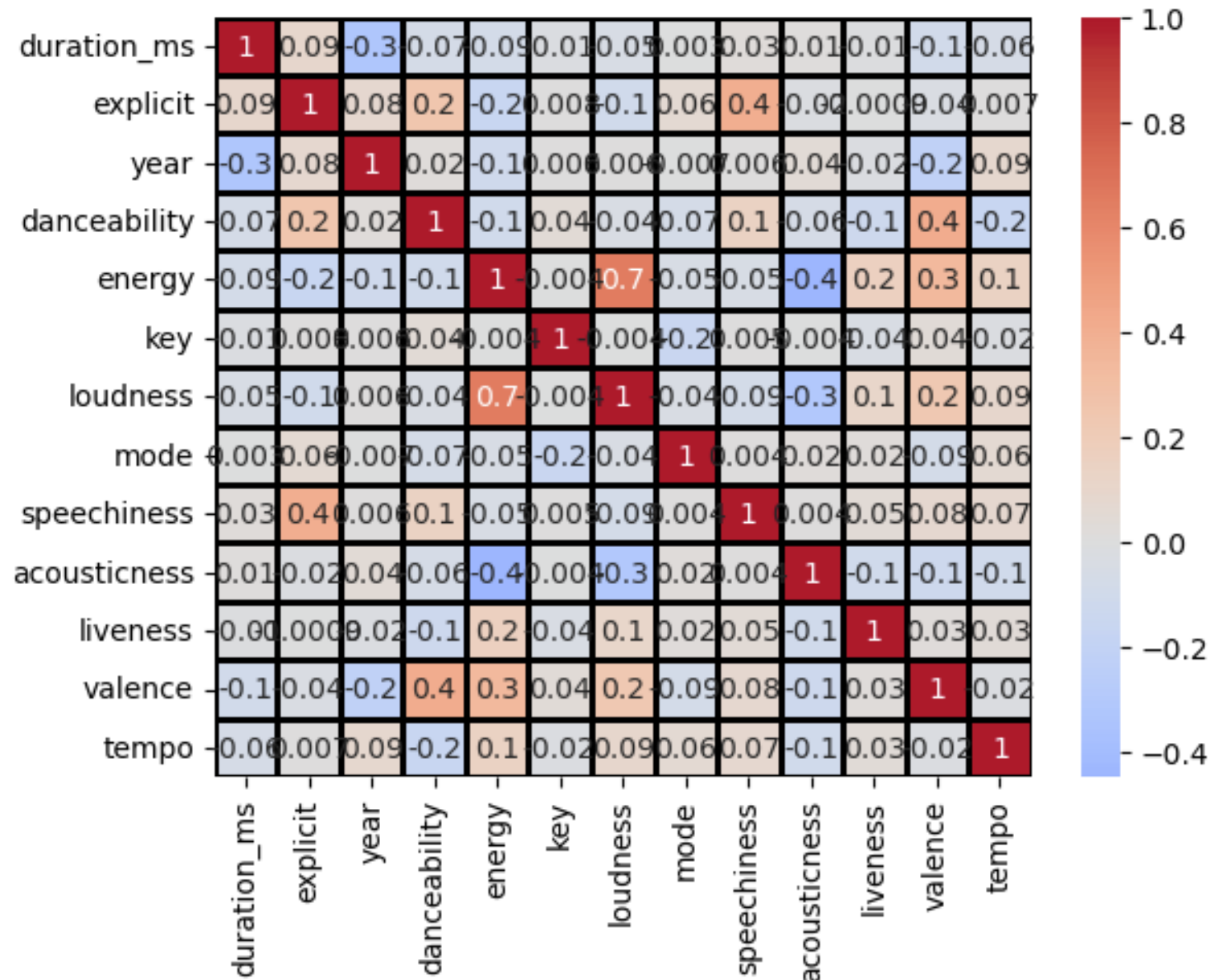


## Positive danceability correlations:

- Valence (measure describing musical positiveness)
- Speechiness

## Negative danceability correlations:

- Tempo
- Liveness
- Energy



# Predicting Danceability with Random Forest

Combine many decision trees into a single model to improve accuracy.

78%  
accuracy

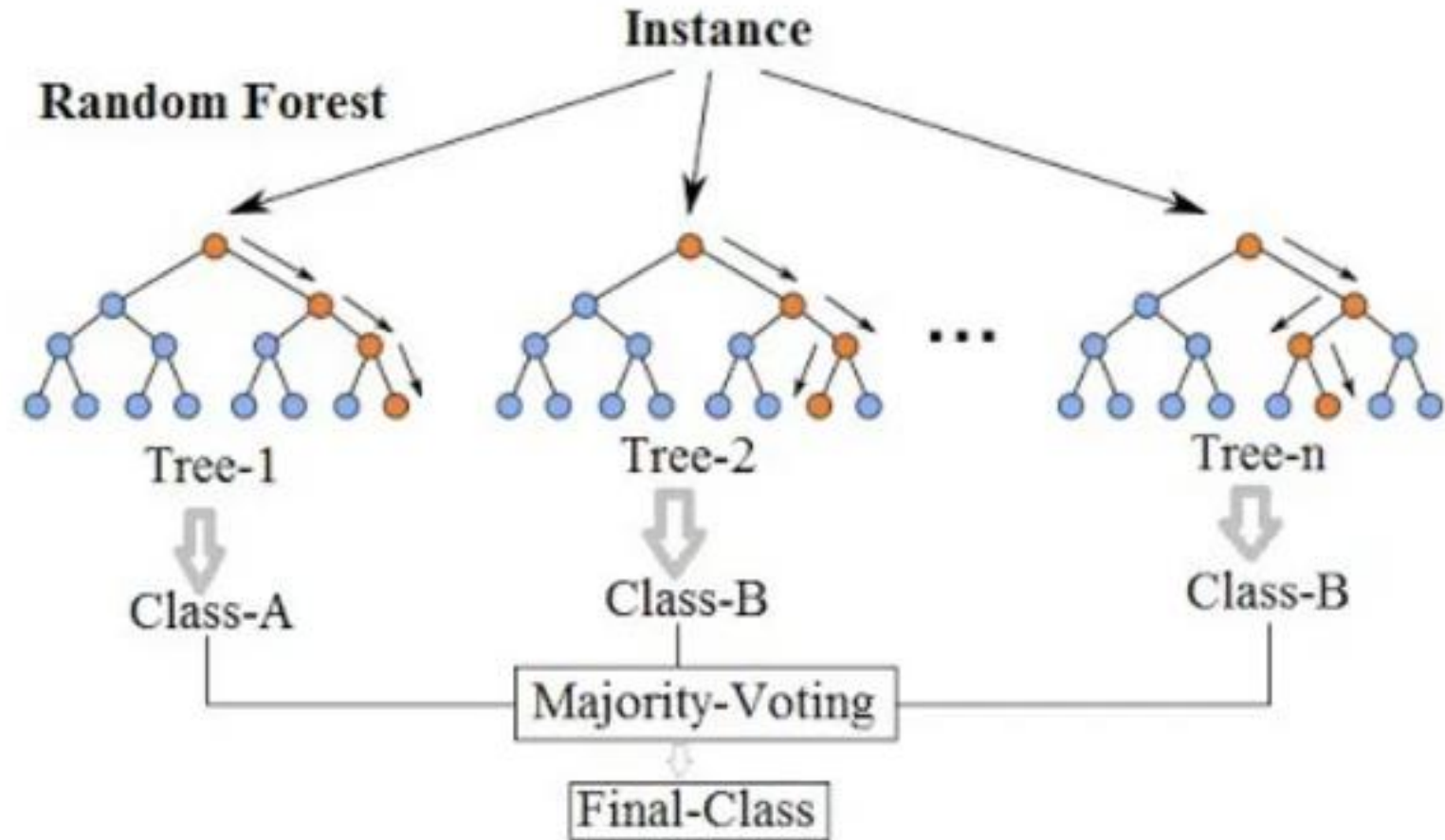


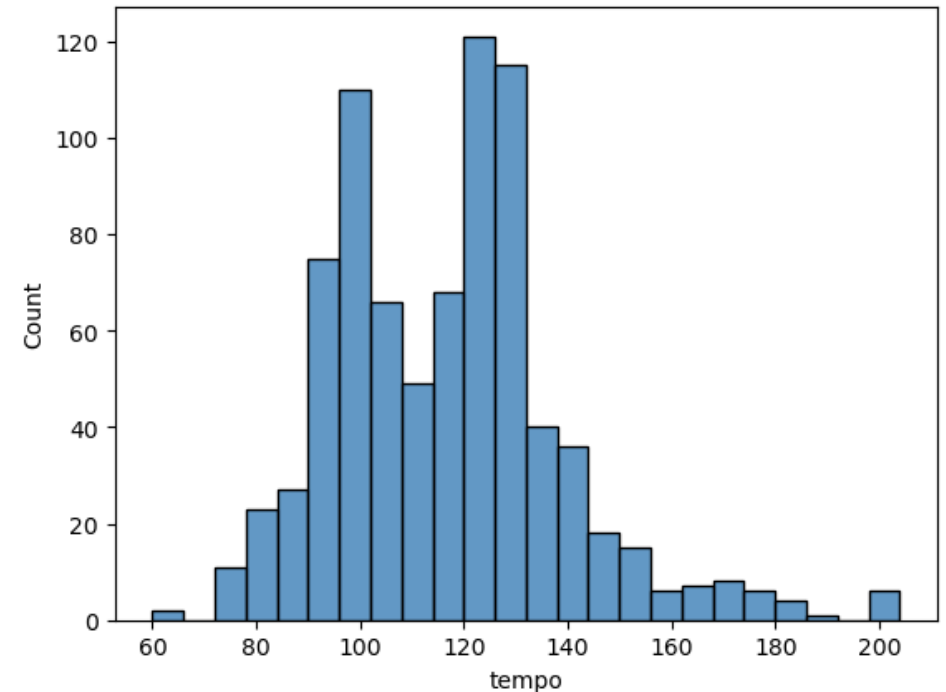
Image credit: [Random Forest Simple Explanation by Will Koehrsen posted on medium.com](#)

# Piper's Weekly Pop Classes

**814** best songs: pop, danceable, < 5 min

-> choose from 512 warm-up, 155 aerobic, 126 strength, and 63 cool down songs

Classes		Duration (min)	Tempo (bpm)	Weekly (min)
aerobic + strength (5)	Warm up	10	100 - 140	50
	Aerobic	20	130 - 170	100
	Strength	20	130 - 150	100
	Cool down	10	60 - 90	50
aerobic (6)	Warm up	10	100-140	60
	Aerobic	40	130 -170	240
	Cool down	10	60 - 90	60

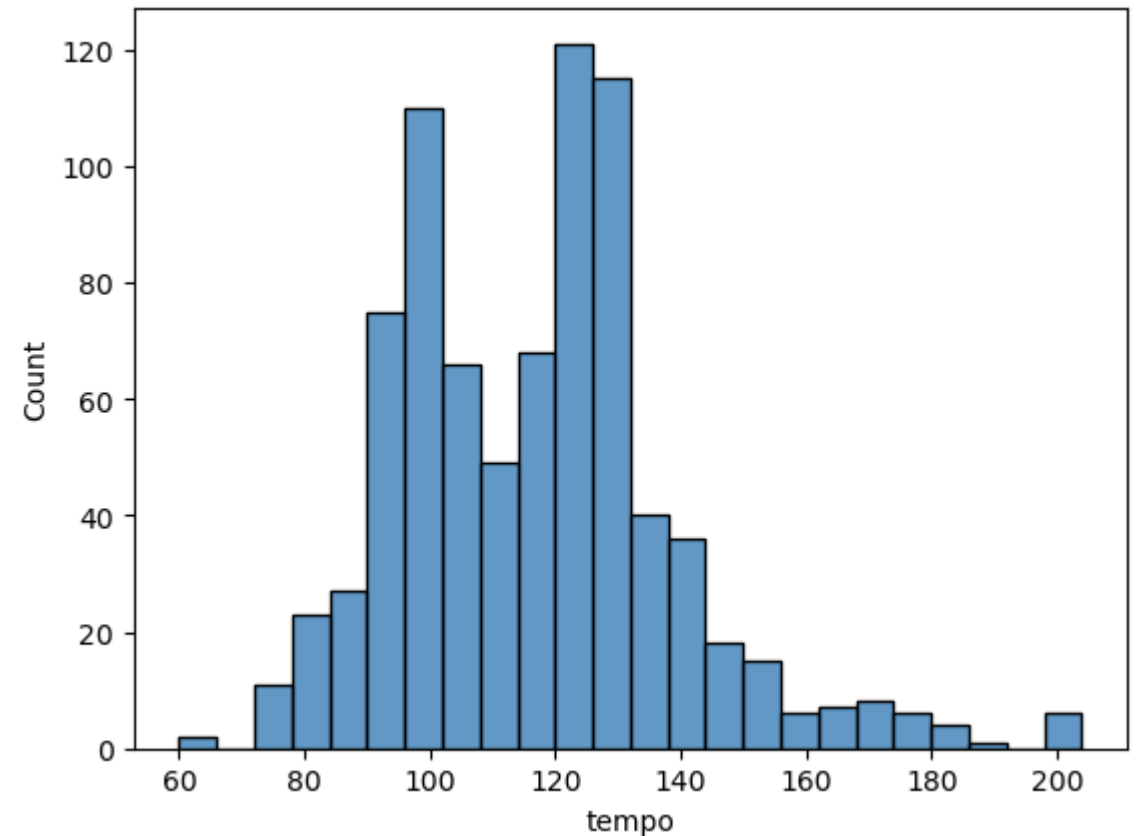


# Molly's Weekly '00 Classes

**437** best songs: 2000s, danceable, < 5 min,

-> Choose from 255 warm-up, 74 aerobic, 126 strength, and 48 cool down songs

Classes		Duration (min)	Temp o (bpm)	Weekly (min)
aerobic (18)	Warm up	10	100-140	180
	Aerobic	40	130 - 170	720
	Cool down	10	60 - 90	180



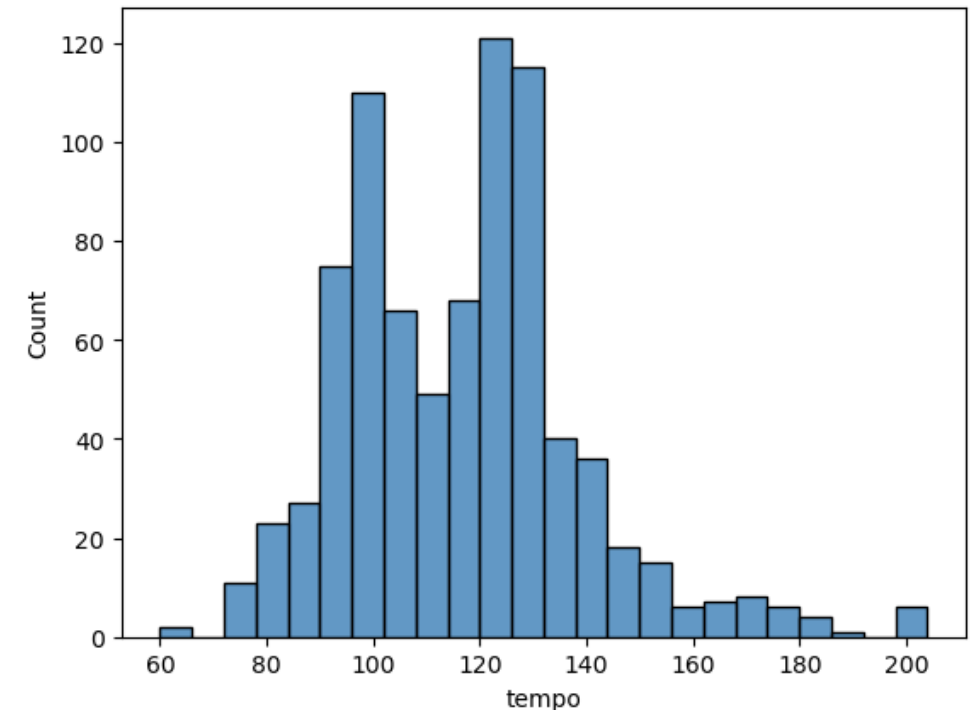


# Teddy's Weekly Hip Hop Classes

**471** best songs: hip hop, danceable, < 5 min

-> choose from 239 warm-up, 110 aerobic, 81 strength, and 54 cool down songs

Class		Duration (min)	Tempo (bpm)	Weekly (min)
aerobic + strength (9)	Warm up	10	100 - 140	90
	Aerobic	20	130 - 170	180
	Strength	20	130 - 150	180
	Cool down	10	60 - 90	90
aerobic (4)	Warm up	10	100-140	40
	Aerobic	40	130 -170	160
	Cool down	10	60 - 90	40



# Next Steps

- Build a model to automatically create playlists for each class using appropriate genre and tempo classifications
- Add more songs to the available song list to ensure variety, model can assign new songs appropriately