Collaborative filtering -> last.fm

Spotify 3 types of rec models:

1. Collaborative filtering
   1. Analyzes your behavior and others behavior
      1. Netflix used explicit data (ex: star ratings)
      2. Spotify uses implicit data (ex: stream counts)
         1. Uses matrix math using python’s library
         2. Each user represents a row in the matrix
         3. Each column represents each song in the Spotify database
         4. Represents two types of vectors (x and y)
            1. X is a used vector each users taste
            2. Y is a song vector presenting one single song’s profile

Collaborative filtering takes each x and matches it with similar songs, does the same for y as well

1. NLP models
   1. Analyzes text
      1. Spotify crawls the web on blog posts and other written text of what people say about artists and songs
         1. Don’t know how Spotify uses this NLP
            1. **I WILL SPECULATE**
         2. Echo nest
2. Audio models
   1. Analyzes the audio tracks
      1. Take into account new songs
         1. Collaborative filtering won’t work as there’s < 50 listens, and NLP won’t work as there’s no articles on it, then comes audio models
      2. How?
         1. Use CNN
            1. Same to facial recognition

Modified for use on audio data vs. pixels

* + - * 1. After processing, NN spits out key, mode, tempo, loudness, dance ability, etc.

This allows Spotify to see fundamental similarities between songs and shows which users might like them based on listening history

Uses lots of Hadoop clusters