

Activity Card for Unit 7

Handout 2

Music and Machine Learning Final Project Overview

In this unit we create music recommender systems to understand the capabilities, benefits and limitations of machine learning. Over the course of the unit you will make a slideshow to share what you have learned about building music recommender systems. You will use this slideshow to tell someone in your life about machine learning, and why to be both excited and critical about it.

Materials:

- [Individual Slideshow Template](#)
- [Unit 7 Project Criteria and Feedback Rubric](#)

Create a slideshow. Each section of the slideshow is described below:

- **Section 1: Define Machine Learning and Filtering Methods**
 - On a slide(s), write a summary statement describing what Machine Learning is. Be specific about what it is and share some examples of how it is used. Consider using quotes or visuals to support your description.
 - On an additional slide(s), write summary statements describing each filtering method: Content-Based and Collaborative. Be specific about what each is and how the methods are different. Share some examples of each from the class gallery walk. Consider using visuals to support your description.
- **Section 2: Content-Based Filtering**

Share the three different models and their predictions for each content-based filtering model you create. See the handout for details on what to add to your slideshow.

 - [Content-Based Filtering: Building a Model to Predict Ratings \(Handout 4\)](#)
 - On a slide, write a summary of your reflections and learning on content-based filtering.
 - On a slide, create a flowchart that describes your content-based filtering recommender system. Be specific about the inputs, outputs, and how the model works.
- **Section 3: Collaborative Filtering**

Share your decisions when creating your collaborative filtering model and the resulting predictions.

 - On a slide(s), describe your liking function and why you chose this function. Include a screenshot of your liking function code.
 - On a slide(s), add a picture of your conditional probability calculations for you and your partner and how you interpret them ([Handout 6](#)).

- On a slide(s), add a picture of the two by two matrix representing the conditional probability for you and your partner. Describe what the matrix shows and how it can be interpreted.
 - On a slide(s), add a screenshot of your probability (similarity) vector with the whole class. Explain what this vector reveals about your preferences and those of your classmates.
 - On a slide(s), analyze your recommender system results and add a screenshot of your results. Consider the following questions in your analysis of your results:
 - What do your results look like compared to your actual rating?
 - Were there any surprises? Why do you think that happened?
 - What does this add to your understanding of collaborative filtering?
 - How might you change your model to be more accurate?
 - On a slide, create a flowchart that describes your collaborative filtering recommender system. Be specific about the inputs, outputs, and how the model works.
- **Section 4: Comparing Filtering Methods**
 - Share your reflections and take-aways about how the two filtering methods compare. On a slide, consider the following questions;
 - Which method did you like better for making recommendations? And why?
 - Which method was better at predicting your ratings?
 - What are the strengths of each?
 - Which would you choose to use? Or would you use a combination of both?
 - What might the biases be in each method?
 - **Section 5: Data Ethics of Machine Learning**

Share your thoughts about the ethics of machine learning. See [Handout 8](#) for details on what to add to your slideshow.

 - On a slide(s), explain what is the most important information for the general public to know about machine learning. Be specific about some action items for machine learning algorithms in daily life. Include quotes from the videos and articles on machine learning support your thinking.

Prepare your presentation

Review and polish your presentation. Decide on your audience and make revisions to your slideshow to connect with your audience. See the handout, [Preparing Your Presentation \(Handout 9\)](#) for specific considerations for this process.