ECE 229 Project Proposal | Project 8

Book Recommendation System

Problem & Background

One of the most challenging problems for book lovers is to find exciting books amongst the plethora of books. When we go to the library and buy or borrow books, we risk our time, effort, and potentially money to find a book that we like. To reduce the so-called risks, we want to propose a recommendation system that helps readers choose the books that fit their needs and tastes. To do this, we want to investigate the passing trend and a combination of a book's attributes such as genre, author and their writing experience, publishing year, etc. Also, other than filtering options, to create a more customized recommendation, the user would adjust the weight of each attribute to generate recommendations based on their preferences.

Datasets

1. Goodreads best books ever | Link | 54301 rows and 12 columns
   #Amazon best-selling books | Link | 536 rows and 6 columns

2. Goodreads authors | Link | 22892 rows and 20 columns
image: Book-Crossing: user reviews | Link | multiple datasets (Potential)

Goodreads 10k | Link | multiple datasets

Interactive visuals

We plan to implement our analysis by visualizing and extracting information from multiple classes and different datasets that we mentioned in the dataset part. Then We will utilize these classes and evaluations for the most famous books so individuals can get customized proposals by choosing based on their preference. We are going to use multiple visualization tools such as basemap, which shows the author's locations on the earth map. We will implement multiple bar plots to analyze different classes and compare the results to help users have a better and easier visualization. We will implement statistical techniques such as scatter plots to analyze our dataset based on genres versus rating or genres versus author's locations. All the tools we mentioned above are subject to change, but for now, we plan to use these tools to create interactive visualizations to make decision-making easier for our end-user.

User story

As a user who is looking for a new book, I want to be able to find recommendations based on my preferred genre, author, writing style, and publishing year. I want to be able to see how the book I'm reading fits into each category and to find books similar to the books I like. As a user with preferences in the book's attribute, I want to be able to sort through the library and search through books that match my descriptions. As a new reader, I want to be able to visually see the availability of genres and other book attributes and to find easy to read books based on which ones I want to try. As an avid reader, I want to be able to input all the books I've read before, and to get recommendations for books I might want to try next.

Timeline

Key-Step	**Timeline**	**Person In Charge**
Finding multiple datasets & dataset preprocessing	4/27 - 5/2	Fatemeh, Sepehr
Use multiple tools to visualize the data and analyze different properties	5/2 - 5/10	Pengpeng, Fatemeh
Interactive System design	5/3 - 5/10	Jin, Armin, Pengpeng, Varun
Interactive System Implementation	5/11 - 5-25	Jin, Armin, Sepehr, Fatemeh, Varun, PengPeng

ECE 229 Project OKR Week 5 | Project 8

Book Recommendation System

Objectives + Tasks

Provide the user with a search tab based on genre, author, publish year, country, average rating, number of pages, etc. filters:

- Data preprocessing (Merging datasets based on their common columns, etc.) (This task applies to all the tasks below)
- Setting up AWS (This task applies to all the tasks below)

1. Create filter/quick options for users to get customized recommendations.
   - Create a model with input as filtering options, output as a recommendation.
2. Set up the dashboard on AWS so user can interact with data
3. Create a region-based trend analysis for authors and genres
   - Create a model and return the customized recommendations based on user input.
   - Implement the model on AWS
4. Set up the dashboard on AWS so user can interact with data
   - Connect the front-end input to create the corresponding figure in the back-end.
5. Recommend popular books by a particular author/ in a particular genre/ in an age range/geographical region based on user's read books
   - Create a visualization for better understanding of recommendations
   - Recommending popular books based on a user's book history (by author, genre, etc.)

Progress

Red - the task is yet to begin, Yellow - the task is in progress, and Green - the task has been completed.

Common Tasks	Week 5	Week 6	Week 7	Week8
Data Preprocessing				
Setting up AWS				
Objective 1:				
Create a model (recommendations)				
Objective 2:				
Dashboard creation				
Objective 3:				
Region-based trend model				
Building model on AWS				
Objective 4:				
Front-end Dashboard Creation				
Objective 5:				
Visualization widgets on dashboard				
User history recommendation model				

ECE 229 Project OKR Week 6| Project 8

Book Recommendation System

Objectives + Tasks

This week:

Team 1 - Sepehr, Jin, Pengpeng

- Setting up AWS (This task applies to all the tasks below)
  - Template building for interactive widgets
  - Setting up architecture for client
  - Set up the dashboard on AWS so user can interact with data

Team 2 - Armin, Varun, Fatemeh

- Create filter/quick options for users to get customized recommendations.
  - Create a model with input as filtering options, output as a recommendation.
  - This will feed into the AWS, so integration needs to be built

Next Week's tasks:

- Create a region-based trend analysis for authors and genres
  - Create a model and return the customized recommendations based on user input.
  - Implement the model on AWS
- Recommend popular books by a particular author/ in a particular genre/ in an age range/geographical region based on user's read books
  - Create a visualization for better understanding of recommendations
  - Recommending popular books based on a user's book history (by author, genre, etc.)

Progress

Common Tasks	Week 5	Week 6	Week 7	Week8
Data Preprocessing				
Setting up AWS				
Objective 1:				
Create a model (recommendations)				
Objective 2:				
Dashboard creation				
Objective 3:				
Region-based trend model				
Building model on AWS				
Objective 4:				
Front-end Dashboard Creation				
Objective 5:				
Visualization widgets on dashboard				
User history recommendation model				

ECE 229 Project OKR Week 7| Project 8

Book Recommendation System

Objectives + Tasks

This week:

Team 1 - Sepehr, Jin, Pengpeng

- Setting up AWS (This task applies to all the tasks below)
  - Template building for interactive widgets (ongoing)
  - Setting up architecture for client (ongoing)
  - Set up the dashboard on AWS so user can interact with data (ongoing)
  - Finalizing webapp solution and deployment process

Team 2 - Armin, Varun, Fatemeh

- Creating recommendation system based on input book
  - Creating a model for clustering based on books features (ongoing)
- Storing books reviews from Amazon for book recommendation (ongoing)
  - Applying NLP techniques on books reviews for later analysis

Next Week's tasks:

- Create a region-based trend analysis for authors and genres
  - Create a model and return the customized recommendations based on user input.
  - Implement the model on AWS
- Recommend popular books by a particular author/ in a particular genre/ in an age range/geographical region based on user's read books
  - Create a visualization for better understanding of recommendations
  - Recommending popular books based on a user's book history (by author, genre, etc.)
- Working on combining recommending model with AWS instances

Progress:

Common Tasks	Week 5	Week 6	Week 7	Week8
Data Preprocessing				
Setting up AWS				
Objective 1:				
Create a model (recommendations)				
Objective 2:				
Region-based trend model				
Building model on AWS				
Objective 3:				
Front-end Dashboard Creation				
Objective 4:				
Visualization widgets on dashboard				
User history recommendation model				

ECE 229 Project OKR Week 8| Project 8

Book Recommendation System

Objectives + Tasks

Model 1 - Data Exploration and Visualization

- Initial filtering system built (Done)
- Built Dashboard with Dash (Done)
- Continuing to work on visualizations + dash tab system to improve user experience

Model 2 - Book Recommender

- Creating recommendation system based on input book
  - Creating a model for clustering based on books features (Done)
- Creating dashboard for widgets (ongoing)
  - Creating the widgets for the user story to have a smooth experience
  - Create a region-based trend analysis for authors and genre
  - Recommend popular books by a particular author/ in a particular genre/ in an age range/geographical region based on user's read books

Model 3 - Amazon Reviews

- Create an analysis for books from amazon reviews
  - Create a model and return the keywords of main points from a set of amazon reviews based on user input.
  - Show top reviews as filtered by a particular author/ in a particular genre/ in an age range/geographical region

Deployment:

- Combine all models in one master file and deploy on AWS

Progress:

Common Tasks	Week 5	Week 6	Week 7	Week8	Week 9
Data Preprocessing					
Setting up AWS					
Objective 1:					
Create a model (recommendations)					
Objective 2:					
Region-based trend model					
Building model on AWS					
Objective 3:					
Front-end Dashboard Creation					
Objective 4:					
Deployment					
User history recommendation model					

ECE 229 Project OKR Week 9| Project 8

Book Recommendation System

Objectives + Tasks

Model 1 - Data Exploration and Visualization

- Initial filtering system built (Done)
- Built Dashboard with Dash (Done)
- Continuing to work on visualizations + dash tab system to improve user experience

Model 2 - Book Recommender - FINISHED

- Created a book recommendation system based on input book
  - Creating a model for book recommendation using NLP based methods on books features (Done)
- Created a dashboard for using Dash for the Book Recommendation Engine
  - Created a search bar that allows for discrepancies in user input
  - Design UI for displaying recommended book with graphics

Model 3 - Amazon Reviews

- Create an analysis for books from amazon reviews
  - Create a model and return the keywords of main points from a set of amazon reviews based on user input. (ongoing)
  - Show keywords of reviews as filtered by a particular author/title in a particular genre/ in an age range/geographical (ongoing)
  - Dashboard creation based on book recommender part(model 2)

Deployment:

- Combine all models in one master file and deploy on AWS

Progress:

Common Tasks	Week 5	Week 6	Week 7	Week8	Week 9
Data Preprocessing					
Setting up AWS					
Objective 1:					
Data Distribution Analytics					
Objective 2:					
Genre-based trend model					
Building model on AWS					
Objective 3:					
Front-end Dashboard Creation					
Objective 4:					
Deployment					
Amazon recommendation model					