CS-373 IDB Technical Report: Group 12
Phase 3

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Website
wineworld.me

GitLab repository
https://gitlab.com/rparappuram/cs373-idb-12

Motivation
WineWorld is an innovative platform that provides a comprehensive guide to the world of wine, vineyards, and wine regions. Our goal is to empower wine enthusiasts, from beginners to experts, to explore and deepen their understanding of this fascinating industry. With a focus on civic engagement, WineWorld also seeks to connect wine lovers with the wine community and promote their involvement in supporting the industry. Our platform provides information about different wines, vineyards, and wine regions, as well as resources for learning more about wine appreciation and tasting.

User stories
Phase 1
Written by WineWorld for ParkScape
1. **Filter cities based on money range** - I'm traveling to California next month with my family of six and am unsure about which cities to visit. We're limited on money but are still interested in traveling for my children. I think it would be easier for us to use your site if I could filter cities based on a certain range of money it may cost to go to that city.
2. **Language support** - Hello, I am a foreigner from France planning on visiting America. I would like to use your website to plan my visit around New York and Florida, but my English is not very good. Are there plans to provide language support for languages that is not English like French?

3. **City accessibility for disabilities** - Hi, I have a disability that affects my movement and stumbled upon your site while looking for travel planning apps. I'm in need of an app that could tell me some sort of idea of how accessible cities are for people like me. Is that something that you guys are planning to implement or could implement?
4. **Park image** - I'm a visual learner and want to learn more about specific parks. I'd love to see an image of the parks that are available on your website. It'll give me more insight into the parks I'm considering traveling to.
5. **Airport ratings** - I'm a frequent flier and want to make sure that I go to the best airport. I'd like to see ratings on your website of the best airports so I know which ones I should chose.

Written by ParkDex for WineWorld
1. **Search by country** - Howdy! I'm from Texas, and I'm really into wine. I want to expand my tastes worldwide! Is there a way I can search for wines by country?
   a. We implemented this by adding a dropdown to our wines page that contains names of countries to display. When a country is selected, it will be passed to our API to find wines from that country so the front end can display it. Additionally, you can filter by multiple countries at a time.
2. **Sort/Information about wine-making techniques** - Hi, I'm a user who's really into self-sustainability. I'm solely interested in wine-making techniques, so that way I won't have to buy from BIG-WINE companies. How would I go about getting information about wine-making techniques?
   a. While there are currently no plans to obtain wine-making technique information for an individual bottle of wine, it certainly is possible to find this information using wineworld.me. You can first find the region for your wine on its wine web page. Then, you can search for that region on the region page and see the other related wines and vineyards to learn more about what to expect from that region's wines.
3. **New user experience** - Greetings, I am a user who has no self-control and I want to IMPULSE BUY the latest thing I see on my social media feeds. The current trend: WINE. There's so many different types of wine, is there a way you can have a display of recommended wines for people new to wines?
   a. Yes! In this phase, our wines and vineyards will automatically display the best and most relevant wines and vineyards to your search. You can further filter wine regions by tags (such as business or couples) and click on the instance pages to see related wines linked below that suit those occasions.

4. **Nearby vineyards by city** - Hi, my mother is visiting Austin and she is DEMANDING that we spend "family" time together. She is a high-functioning wine connoisseur. Can I search for vineyards near Austin, if not in the state of Texas?
    a. You can search by regions and vineyards with our search functionality and then browse through our options. Each resulting instance will have related instances of the other models to make it easier for you. For example, you may search up a region in either the region model or sitewide search bar and the results will direct you to relevant instances that provide connections to nearby vineyards.
5. **Sort ascending/descending** - Hey, I'm a college student that likes to window shop things I can never afford (I like to dream). I like to browse the most expensive, highly rated wines on the market. Can I sort by ascending/descending order on your website?
    a. Yes, you can. We implemented this by adding a dropdown to our model pages containing several different sorting options, which will be passed to our API to apply the sort and return the instances to display on the front end. The sort relevant to you would be the Price (high to low) sort option in the vineyards model. Similar sorting and filtering features are available in the other models with the applicable attributes.

Phase 2

Written by WineWorld for ParkScape
1. **Git text on home page** - I think your website looks very nice, but I think it could be cleaner and more professional. Currently, there appears to be git text on the home page which makes it appear quite messy. I suggest that this should be fixed for the future.
2. **Light/Dark mode** - Hi, I'm a user with sensitive eyes. I want to use your website in Dark mode so as to not hurt my sensitive eyes. I think it'll help others as well with accustoming your webpage to my system settings in terms of light/dark mode.
3. **Flights from my location to airport** - Hi, I'm planning a vacation for me and my girlfriend and I'm looking through the airports. I thought it would be a nice feature if I could see how much flights from my nearest airport to the one I'm currently viewing cost, so I don't have to go to another website to find out.
4. **Responsive Design** - Hi, I'm a travel influencer so I'm always on the go and I frequently use my phone. The design of your website is not very friendly for mobile devices; for example, the navigation bar is not fully visible. I would like a responsive design to adapt your site to be compatible with different screen sizes and devices.

5. **Budget Scale** - I'm planning a trip with my friends over Spring Break, and we're using your site to decide which city to visit. Our collective budget overlaps the Medium and Medium High ranges; we would rather set the low and high bound ourselves. Implement a sliding scale for city budgets to filter on a user-provided numerical input.

Written by ParkDex for WineWorld
1. **USER STORY: API Documentation.** - Greetings, I was looking to try and have some information about wine on my own website. Is there a readily available API I could utilize on my website? What kind of information can I expect from the API?
   a. We implemented this by setting up a flask web server that would respond to requests, and we created documentation on Postman so other users could understand how to utilize our API.
2. **USER STORY: Instances per page.** - Hello there! I like to look at large selections of wines at a time. Is there a possibility I could have many instances of wines on one page? How many instances is your website designed to handle?
   a. Of course! Our website currently displays 20 instances per page for wines, vineyards, and regions to view and click easily and we will retain this feature for Phase 3's sorting and filtering capability. We have implemented pagination to restrict the total number of instances shown at a time to 20 for easy viewing. The next set of 20 instances can be seen by clicking the next button for a total upwards of 50 instances for each model.
3. **USER STORY: Sort by size** - Hello, an extremely wealthy relative of mine recently passed and left me a large fortune. I would love to purchase a large vineyard with my inheritance. I want the biggest vineyard that I can afford. It would be convenient if I could sort the vineyards by size.
   a. We're not currently looking to add a size attribute to our vineyards, but you can see the relative size of the area on the Google Maps location provided on each vineyard's page. Combining this information with the price level of each vineyard given in its details section will allow you to select a beautiful and successful vineyard to fulfill your dream.
4. **USER STORY: filter by age** - Hello, I cannot stand any wine made after the year 2000. They just stopped making wine like they used to at the turn of the millennium. Is there any way I can filter wines by age?
   a. Currently, there is no way to filter our wines by age, but many wines conveniently list their age in their name. You can search for a particular year in our sitewide or wine model search bar to find wines made in that specific year. It is possible to select a region and see related wines on its page to search for wines that are culturally significant to the area. Picking a region with a

long-standing history in wine-making will allow you to browse wines that suit your preferences.

5. **User Story: filter by dietary restrictions** - Shalom! I am a wine connoisseur with dietary restrictions. I often have trouble finding new wines because not all wines are kosher. I would greatly appreciate a feature that allows wines to be filtered by dietary restriction.

    a. This is currently out of scope for our project but we may look into implementing this in Phase 4. For now, our vision includes filtering wines by region, so you may select a wine-making region known to produce kosher wines to see which wines may accommodate your needs. Alternatively, you may browse regions on the regions page and select one to see its related wines and vineyards to get a better idea of what they offer.

Phase 3

Written by WineWorld for ParkScape

1. **Narrowing down results** - Hello, when I visit a page, such as parks, I would like to narrow down the results to fit some criteria. I noticed you have attributes I could filter by, but when I select some options and click Apply, the results don't change. Will this feature be implemented?

2. **Social platform presence** - Hello, I really want to share your website with my peers on social platforms, such as Facebook, Twitter, Discord, etc., but it doesn't display very nicely. I think utilizing the Open Graph protocol would be a great addition that would help your site look more pleasing when sharing. I'll include a screenshot of how your site currently appears on Discord, and I hope you can consider the idea.

3. **Add favicon** - Hello, your website looks very clean, but the current favicon doesn't seem to be very closely related to your website. It seems that it's the generic React favicon. I think adding a favicon would help make your site standout from others.

4. **Attributes in url** - Hello, I like to ask my friends for their opinions on my selections on your site. Typically, this involves me sharing the url with my friends, telling them what attributes I filtered by, and then reapplying those attributes on their own. I was wondering if it's possible if the url I share with my friends could include the filters/settings I've selected on my page so that way I don't have to tell them what I selected, and they don't have to manually apply those settings.

5. **Loading content** - Hello, I'm using your site and at times, the content does not load. I've inspected the page, and it seems that there are some errors that occur involving your API. I'll include a screenshot as an example, but I hope there are plans to fix this.

Written by ParkDex for WineWorld

1. **USER STORY: Dark mode.** – Hi, I'm a user with sensitive eyes. Is there an option to have your website in dark mode? This will help me heaps, thanks!
   a. Yes, we already have a dark mode implemented and as our website expands we accommodate these settings in new features. Pages will have a black background and white text where applicable when this mode is turned on.
2. **USER STORY: Sort by reviews.** – Greetings, I am a user that likes to read reviews about products I have interest in. I tend to ignore positive reviews in place for negative reviews. The more reviews the better! Is there a possibility I could sort wines by the amount of reviews it has?
   a. Yes, we have included sorting and filtering to specify the number of reviews you would like a wine, vineyard, or region to have! You will be able to sort by the number of reviews it has in both ascending and descending orders. In addition, we have provided filters for you to use that specify the minimum and maximum number of reviews you would like your wine, vineyard, or region to have.
3. **USER STORY: Sort by ratings.** – Howdy, I prefer only the highest rated products when I go shopping. Anything short of 4.5 is not a product I shall consider. Will there be a way to sort wines by rating?
   a. Yes, we have included a way to sort by ratings (in both ascending and descending order) so that you can see wines, vineyards, or regions with the highest ratings first. In addition, we have provided filters that allow you to search for wines, vineyards, or regions that are within the range of a minimum and maximum rating.
4. **USER STORY: Website icon** – I was wondering if your website would include a recognizable icon similar to that of YouTube or Google. I don't think a blue nucleus would fit the theme of WineWorld very well. Is this something the team is considering?
   a. Yes we have added a Favicon that is more fitting to the theme of WineWorld. We have also updated the Tab title.
5. **USER STORY: Pagination** – I would like the ability to skip several pages. I have this particular brand of wine I enjoy but it's always on page 5 of the wines tab. So, when I want to see this particular bottle of wine, I have to click 5 times to reach my desired page. Can you implement a solution for this?
   a. Yes, we have updated the pagination with multiple buttons so that you can go forward/backwards four pages. You can also skip to the very front or very back, and there is a dynamic page selector that lets you click through the page numbers.

RESTful API

Documentation

Base URL

Endpoints

/wines/:id
- Provide an integer id in path
- Returns data on the wine with the given id
- Used to get information about a wine

/vineyards/:id
- Provide an integer id in path
- Returns data on the vineyard with the given id
- Used to get information about a vineyard

/regions/:id
- Provide an integer id in path
- Returns data on the region with the given id
- Used to get information about a region

/wines
- Optional params
  - *[string]* name – Looks for wines with a name that contains this substring.
  - *[boolean]* nameSort – Sorts the returning list alphabetically by name if true; false returns the list sorted in reverse alphabetical order
  - *[array<string>]* country – Restricts the wines to only these countries
  - *[array<string>]* winery – Restricts the wines to only these wineries
  - *[float]* startRating – The minimum rating for a wine to be considered (inclusive)
  - *[float]* endRating – The maximum rating for a wine to be considered (inclusive)
  - *[integer]* startReviews – The minimum review count for a wine to be considered (inclusive)
  - *[integer]* endReviews – The maximum review count for a wine to be considered (inclusive)
  - *[array<string>]* type – Restricts the wines to only these wine types

- - [integer] page – The page to get. Default value 1.
  - Returns a list of wines that match the params given
  - Used to get multiple wines with basic information

/vineyards
- Optional params
  - [string] name – Looks for vineyards with a name that contains this substring.
  - [boolean] nameSort – Sorts the returning list alphabetically by name if true; false returns the list sorted in reverse alphabetical order
  - [array<string>] country – Restricts the vineyards to only these countries
  - [integer] startPrice – The minimum price level for a vineyard to be considered (inclusive)
  - [integer] endPrice – The maximum price level for a vineyard to be considered
  - [float] startRating – The minimum rating for a vineyard to be considered (inclusive)
  - [float] endRating – The maximum rating for a vineyard to be considered (inclusive)
  - [integer] startReviews – The minimum review count for a vineyard to be considered (inclusive)
  - [integer] endReviews – The maximum review count for a vineyard to be considered (inclusive)
  - [integer] page – The page to get. Default value 1.
- Returns a list of vineyards that match the params given
- Used to get multiple vineyards with basic information

/regions
- Optional params
  - [string] name – Looks for regions with a name that contains this substring.
  - [boolean] nameSort – Sorts the returning list alphabetically by name if true; false returns the list sorted in reverse alphabetical order
  - [array<string>] country – Restricts the regions to only these countries
  - [float] startRating – The minimum rating for a region to be considered (inclusive)
  - [float] endRating – The maximum rating for a region to be considered (inclusive)
  - [integer] startReviews – The minimum review count for a region to be considered (inclusive)

- ○ *[integer]* endReviews – The maximum review count for a region to be considered (inclusive)
- ○ *[array<string>]* tags – Restricts the wines to only those that contain all these tags
- ○ *[array<string>]* tripTypes – Restricts the wines to only those that contain all these trip types
- ○ *[integer]* page – The page to get. Default value 1.
- ● Returns a list of vineyards that match the params given
- ● Used to get multiple vineyards with basic information

/wines/constraints
- ● Returns the parameter constraints for the /wines endpoint
- ● Used by the frontend to fill in UI elements for filtering and sorting on the wines model page

/vineyards/constraints
- ● Returns the parameter constraints for the /vineyards endpoint
- ● Used by the frontend to fill in UI elements for filtering and sorting on the vineyards model page

/regions/constraints
- ● Returns the parameter constraints for the /regions endpoint
- ● Used by the frontend to fill in UI elements for filtering and sorting on the regions model page

Models

Wines

Searchable attributes	Sortable/filterable attributes	Forms of media
● Name	● Name ● Country ● Rating ● Region ● Review count ● Type ● Winery	● Image of wine ● Reddit embeds of posts that mention the wine's type

Vineyards

Searchable attributes	Sortable/filterable attributes	Forms of media
● Name	● Name ● Country ● Price level ● Rating ● Review count	● Image from the location ● Google map embed of the location

Regions

Searchable attributes	Sortable/filterable attributes	Forms of media
● Name	● Name ● Country ● Rating ● Review count ● Tags (Food & Drink, Nightlife, etc.) ● Trip types (Business, Friends getaway, etc.)	● Image from the location ● Google map embed of the location

Relationships
Wines and Vineyards
Users will be able to see which wines could be available at a vineyard, which could influence whether they visit a vineyard or not.

Wines and Regions
Users will be able to see which wines can be found in a region, which could influence whether they visit a region or not.

Vineyards and Regions
Users will be able to see what vineyards are located in a region, which could help them plan a visit to the region.

<u>Tools</u>
Frontend
- Node.js – Main programming language
- React – Develop frontend

- React-Bootstrap - Add styling to frontend
- @react-google-maps/api - React component wrapper for Map element
- Selenium - GUI testing
- Jest - JavaScript testing framework

Backend
- Python - Main programming language
- NameCheap - Domain registration
- AWS Amplify - Host and deploy app
- AWS Route53 - Routing AWS Amplify app to domain
- Postman - Create API documentation
- DigitalOcean Droplets - Hosts our backend server
- DigitalOcean Managed Databases - Hosts our database
- MySQL - The underlying database
- Flask - Micro web framework
- SQLAlchemy - Object relational mapper used to manipulate database

General
- VS Code - Code editor
- Teams - Virtual meeting platform
- GitLab - Version source control
- Docker - Allow developers to be on a standardized environment

Data sources
Wines
- https://sampleapis.com/api-list/wines
  Main source of wine data and originating region names.
- https://www.reddit.com/r/wine/
  Source of reddit posts that mentioned wine types found in our wine data.

Vineyards
- https://docs.developer.yelp.com/reference
  Used to get information on local businesses within regions.

Regions
- https://tripadvisor-content-api.readme.io/reference/overview
  Used to get information on local attractions within regions.

Hosting

wineworld.me was secured by purchasing from NameCheap, and we use AWS Amplify and Route53 to connect the domain with the frontend, which is served by AWS. Our backend and database is hosted through DigitalOcean's Droplets and Managed Databases, respectively.

Pagination implementation

Pagination was implemented in the backend for the three list endpoints (/wines, /vineyards, /regions). It works such that the frontend would pass a page number as an argument in the request to the backend. The backend would then append a LIMIT clause to our SQL query to obtain the appropriate rows and return a list of at most 20 instances for the given endpoint.
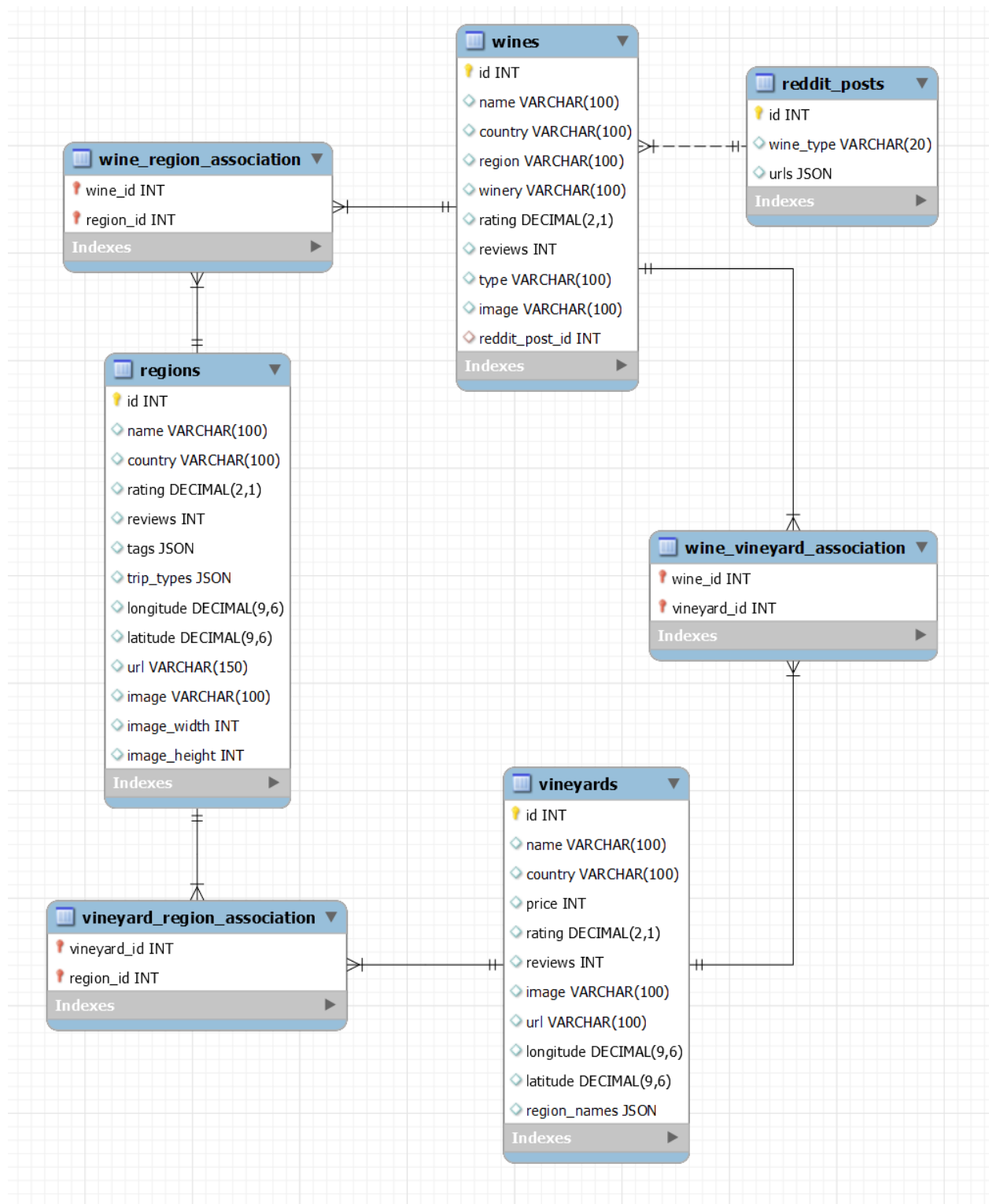
On the frontend, each model page internally has a page number and upon opening a model page the value of the page number is one and makes an API call using that page number in the params. Furthermore, each model page contains next and previous buttons to change the page. When clicking these buttons, it will make another call to our API with the new page number to get the new results. In order to prevent unnecessary calls to our API, e.g. calling with a page number out of bounds of the total number of pages, the responses from our API calls also have a property that contains the total number of pages possible. This value is stored internally as well and allows us to check if the new page number is within bounds. If it is, we make a new API call, otherwise we do not.

Database implementation

Our database is using MySQL and is hosted on DigitalOcean's Managed Databases. On our schema, we have seven tables consisting of the following:
- 3 tables for each of our models (wines, vineyards, and regions)
  - Contains data specific to that model
- 3 tables for each model-to-model (many to many) relationships (wines-vineyards, wines-regions, vineyards-regions)
  - Each of these tables contain rows of two foreign keys in which correspond to a relation/association between two instances of differing models.
- 1 table for reddit posts
  - One to many relationship - one row of reddit posts to many rows of wines

For more details, please refer to this diagram of our database. It shows the data stored in each table and the relationships between tables. For a larger image, please refer to the file, db_diagram.png, in our GitLab repository.

wines
- 🔑 id INT
- ◇ name VARCHAR(100)
- ◇ country VARCHAR(100)
- ◇ region VARCHAR(100)
- ◇ winery VARCHAR(100)
- ◇ rating DECIMAL(2,1)
- ◇ reviews INT
- ◇ type VARCHAR(100)
- ◇ image VARCHAR(100)
- ◇ reddit_post_id INT

Indexes ▶

reddit_posts
- 🔑 id INT
- ◇ wine_type VARCHAR(20)
- ◇ urls JSON

Indexes ▶

wine_region_association
- 🔑 wine_id INT
- 🔑 region_id INT

Indexes ▶

regions
- 🔑 id INT
- ◇ name VARCHAR(100)
- ◇ country VARCHAR(100)
- ◇ rating DECIMAL(2,1)
- ◇ reviews INT
- ◇ tags JSON
- ◇ trip_types JSON
- ◇ longitude DECIMAL(9,6)
- ◇ latitude DECIMAL(9,6)
- ◇ url VARCHAR(150)
- ◇ image VARCHAR(100)
- ◇ image_width INT
- ◇ image_height INT

Indexes ▶

wine_vineyard_association
- 🔑 wine_id INT
- 🔑 vineyard_id INT

Indexes ▶

vineyards
- 🔑 id INT
- ◇ name VARCHAR(100)
- ◇ country VARCHAR(100)
- ◇ price INT
- ◇ rating DECIMAL(2,1)
- ◇ reviews INT
- ◇ image VARCHAR(100)
- ◇ url VARCHAR(100)
- ◇ longitude DECIMAL(9,6)
- ◇ latitude DECIMAL(9,6)
- ◇ region_names JSON

Indexes ▶

vineyard_region_association
- 🔑 vineyard_id INT
- 🔑 region_id INT

Indexes ▶

Sorting implementation

On the backend, sorting was implemented by creating a class called SortMethod. The class contained information such as what column would be sorted, the direction it would sort in (ascending/descending), and an ID. For each model, we created dictionaries that mapped IDs to SortMethod objects. On our model endpoints (e.g. /wines), we check for a parameter called sort, which should be the ID of a SortMethod object, and use it to retrieve the appropriate SortMethod object. In our SQL query we use ORDER BY and generate the appropriate clause for that particular sort. When we execute this query, the returned rows will be sorted.

On the frontend, sorting was implemented by providing a dropdown on the model pages where the user can select a sort to use. If a user clicks on a sort, the website will make an API call to have the results sorted and then displayed.

Filtering implementation

On the backend, we check for our filterable parameters in the request of our model endpoints, and if found, we append a WHERE clause that pertains to that parameter's purpose to our SQL query. When we execute this query, the returned rows will be filtered.

On the frontend, filtering was implemented by providing several dropdowns for several attributes on our model pages. The user can click on these dropdowns to reveal options to select or modify. Upon selecting or modifying a filter, the website will make an API call to have the results filtered and then displayed.

Searching implementation

On the backend, we only search through the name column of our models. The user can provide a search term through the parameter called name to our model endpoints. If specified, we append a WHERE clause to our SQL query that will check if the given search term occurs in an instance's name (case-insensitive).

On the frontend, we implement both sitewide searching across all models and searches specific to each model. We specify the search query to our API call to retrieve only the necessary data and display the results on a separate search results page with different tabs for the 3 models in the case of sitewide searching. The matching text in the search result cards will be highlighted in yellow or a no matching search results found message will be displayed.