

Base de Dados

Final Report – LeagueLore

Final Project 2022/2023

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1. Brief Description of the project

The project will focus on creating a database for the Universe of League of Legends, connecting Champions to Alternate Universes, Regions to their Secrets and Stories containing them all.

2. Requirements Analysis

The 1st iteration of requirements analysis can be found [here](#)

The database and thus, its app*, will include all League of Legends Champions, along with what Region they belong to, what Alternate Universes they exist in and in what Stories they appear. Each Region also has Secrets that describe facts or events that occurred in that location, as well as and Tribes (new) residing there. Admins (new) of the site can add, update, or delete each entity.

*The app was made using Windows Forms, in C#

2.1 Contents:

2.1.1 Each **Champion** has their own:

- Name
- Gender
- Description (new)
- Species
- Splash Art
- Release date
- Quote (new)
- Abilities (new)
- Region they belong to
- Stories they participate on
- Alternate Universe they exist on

2.1.2 Each **Region** has their own:

- Name
- Emblem
- Tribes that live there (new) (optional)
- Secrets that occurred there (optional)
- Champions that belong there

2.1.3 Each **Alternate Universe** has their own:

- Name
- Skin Line
- Year Created
- Champions that exist there
- Stories that happen there

2.1.4 Each **Story** has their own:

- Title
- Author
- Link
- Type (new)
- Participating Champion
- Alternate Universe they happen on (optional)

2.1.5 Each **Secret** has their own:

- Title
- Description
- Image
- Region happen on

2.1.6 Each **Tribe**_(new) has their own:

- Name
- Description
- Art
- Region they live on

2.1.7 Each **Admin**_(new) has their own:

- Username
- Password

3. Entity Relationship Diagram

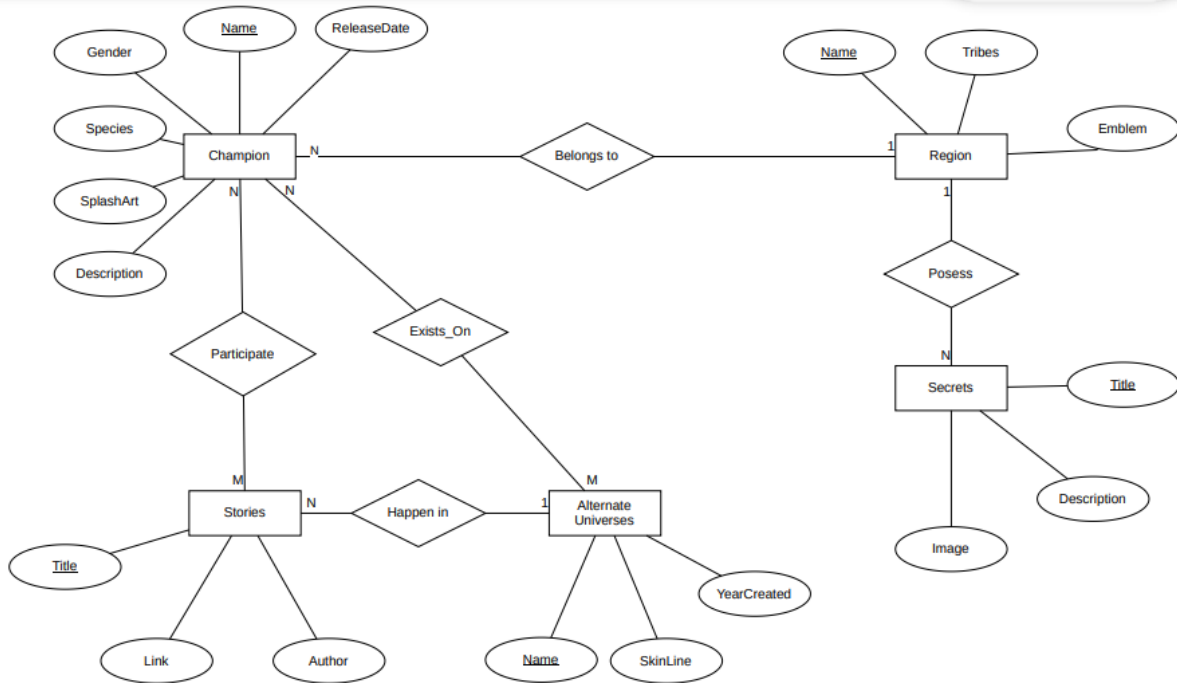


Figure 1: Entity Relationship Diagram from the 1st Iteration (can also be seen [here](#))

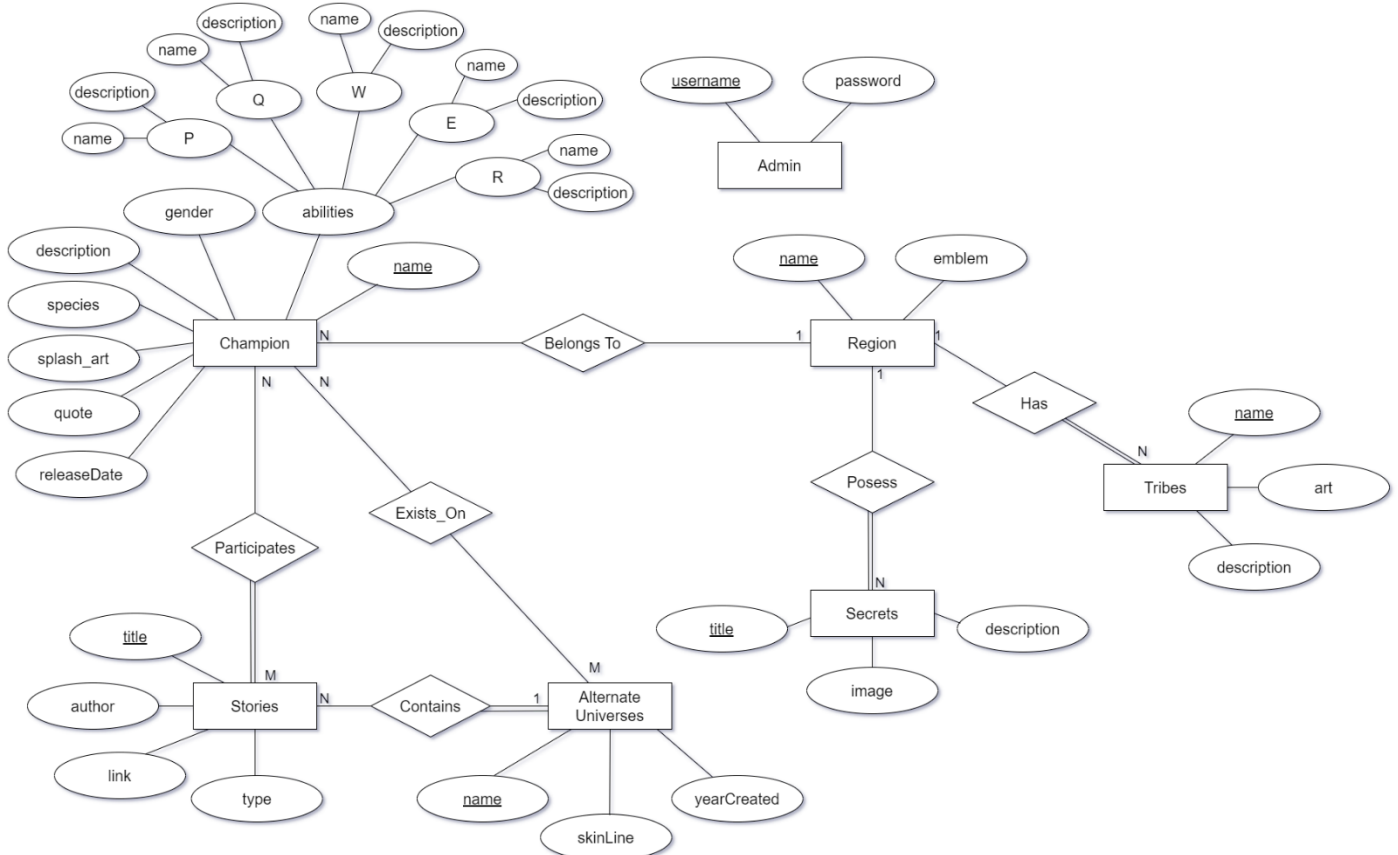


Figure 2: Entity Relationship Diagram for the final project (can also be seen [here](#))

4. Relationship Schema

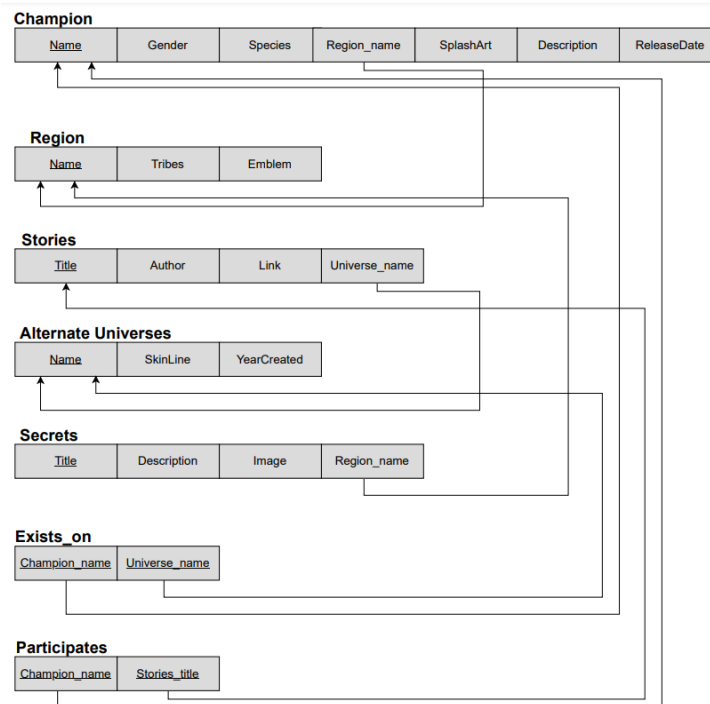


Figure 3: Relationship Schema from the 1st Iteration (can also be seen [here](#))

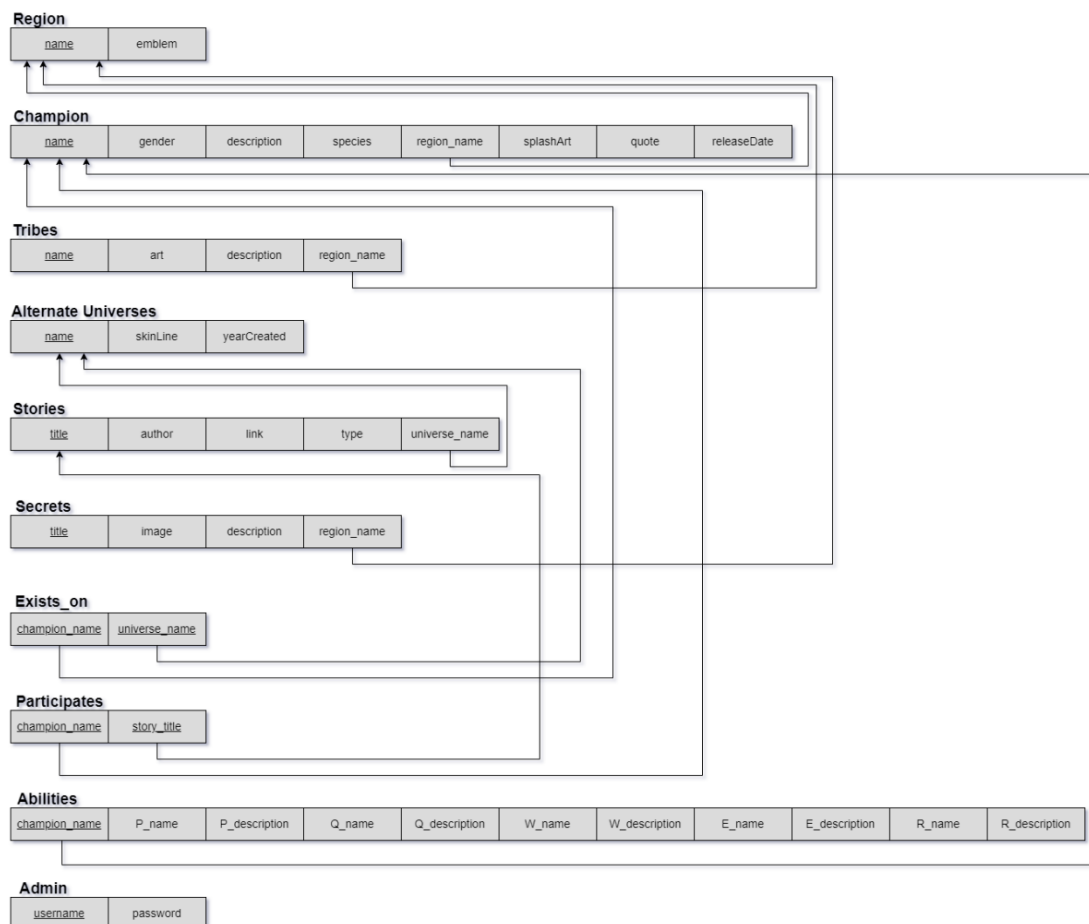


Figure 4: Relationship Schema for the final project (can also be seen [here](#))

5. SQL DDL

All the code related to SQL DDL is in the **01_ddl** folder. The file **1_Tables.sql** creates all the tables for the database.

6. SQL DML

The following forms contain queries or procedures that include SQL DML commands:

6.1.1 Champions

SELECT name FROM Champion – fills the champions list with champion names

SELECT * FROM Champion WHERE name = @ChampionName – shows the selected champion's data

SELECT * FROM Abilities WHERE champion_name = @ChampionName – shows the selected champion's abilities

Filters the dropdown according to selected filters using a procedure

The screenshot shows a web form titled "Champion Info" for the character Akali. The form is divided into several sections:

- Top Section:** Includes a "Back" button, a "Type the name:" text input, an "Or select it:" dropdown menu with "Akali" selected, a "Search" button, and a "Reset Fields" button.
- Filters Section (Right):** Contains radio buttons for "Gender" (Male, Female) and a list of "Region" options: Demacia, Targon, Freljord, Ixtal, The Void, Zaun, Shadow Isles, Piltover, Shurima, Bandle City, Ionia, Bilgewater, and Nexus.
- Main Form Fields:**
 - Name:** Akali
 - Description:** THE ROGUE ASSASSIN
 - Species:** Human
 - Quote:** "If you look dangerous, you better be dangerous."
 - Gender:** Female
 - Region:** Ionia
 - Release Date:** 11/05/2010 00:00:00
- Abilities Section:**
 - Q:** Five Point Strike. Description: Akali throws out five kunai, dealing damage based on her bonus Attack Damage and Ability.
 - W:** Twilight Shroud. Description: Create a smoke screen, gaining invisibility, bonus movement speed, and energy regeneration.
 - E:** Shuriken Flip. Description: Flip backward and fire a shuriken forward, dealing magic damage. The first enemy or smoke.
 - R:** Perfect Execution. Description: Akali leaps in a direction, damaging enemies she strikes. Re-cast: Akali dashes in a direction.
 - Passive:** Assassin's Mark. Description: Dealing spell damage to a champion creates a ring of energy around them. Evading that ring empowers Akali's next Attack with bonus range and damage.
- Image:** A large image of Akali in her signature pose, holding her dual blades.

Figure 5: Champion's main Form

6.1.2 Regions

`SELECT emblem, name FROM Region` – gets every region's name and it's emblem



Figure 6: Region's main Form

6.1.3 Secrets and Tribes (Selected Region)

`SELECT emblem FROM Region WHERE NAME = '{region_name}'` – shows the selected region's emblem

`SELECT description, image, title FROM Secrets WHERE region_name = '{region_name}'` – shows the data of the selected region's Secrets

`SELECT description, art, name FROM Tribes WHERE region_name = '{region_name}'` – shows the data of the selected region's Tribes

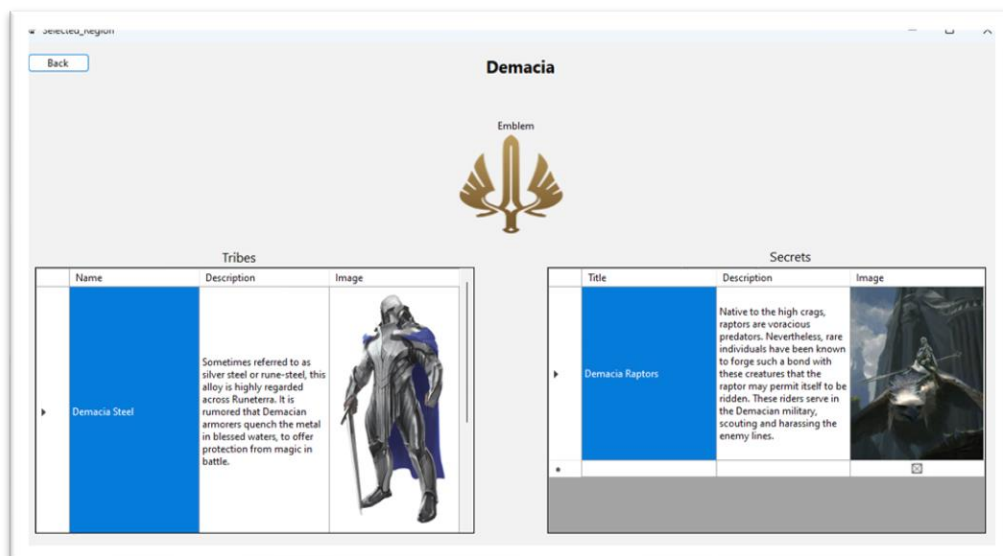


Figure 7: Selected Region's Form

6.1.4 Stories

`SELECT title FROM Stories` – fills the stories' dropdown with stories names

`SELECT author, link, type, universe_name FROM Stories WHERE title = @StoryName` – show the selected story's data

`SELECT champion_name FROM Participates WHERE stories_title = @StoryName` – show the Champions that participate in the selected story

Figure 8: Stories' main Form

6.1.5 Alternate Universes

`SELECT name FROM Alternate_Universe` – fills the universe's comboBox with alternate_universes

`SELECT * FROM Alternate_Universe WHERE name = @ChampionName` – show the selected alternate_universe's data

`SELECT * FROM EXISTS_ON WHERE universe_name = @UniverseName` – show the Champions that exist in the selected alternate_universe

Figure 9: Alternate Universe's main Form

6.1.6 Login

Logs in the user using a procedure

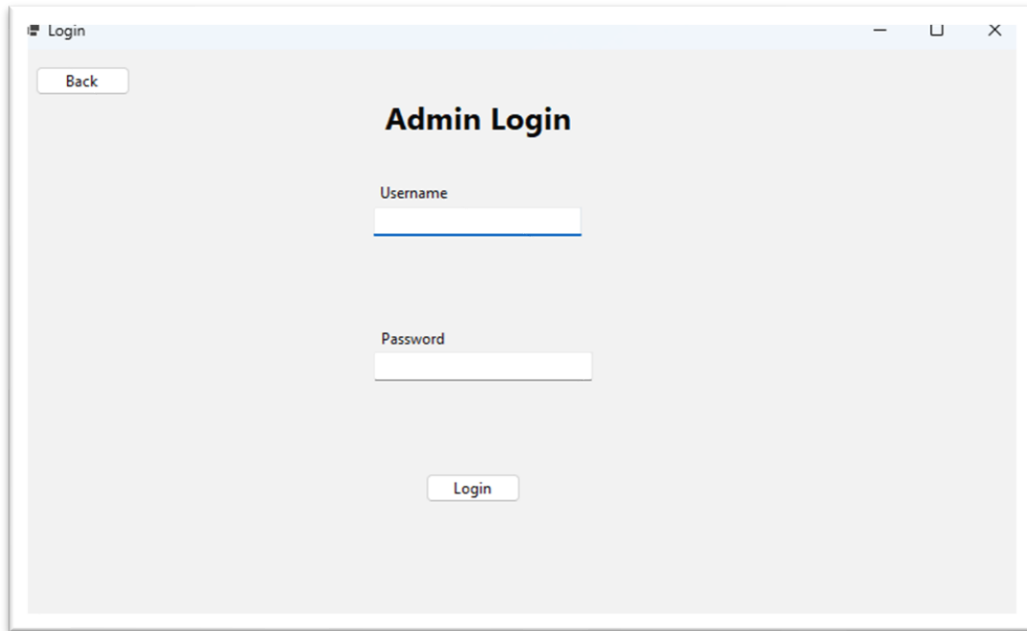
A screenshot of a web browser window titled "Login". The page has a light gray background. At the top left is a "Back" button. In the center, the title "Admin Login" is displayed in bold. Below the title are two input fields: "Username" and "Password". The "Username" field has a blue underline. Below the "Password" field is a "Login" button.

Figure 10: Admin Login

6.2.1 AddChampion

`SELECT name FROM Region` - fills the regions dropdown with region names

`SELECT title FROM Stories` - fills the stories dropdown with story names

`SELECT name FROM Alternate_Universe` - fills the universes dropdown with universe names

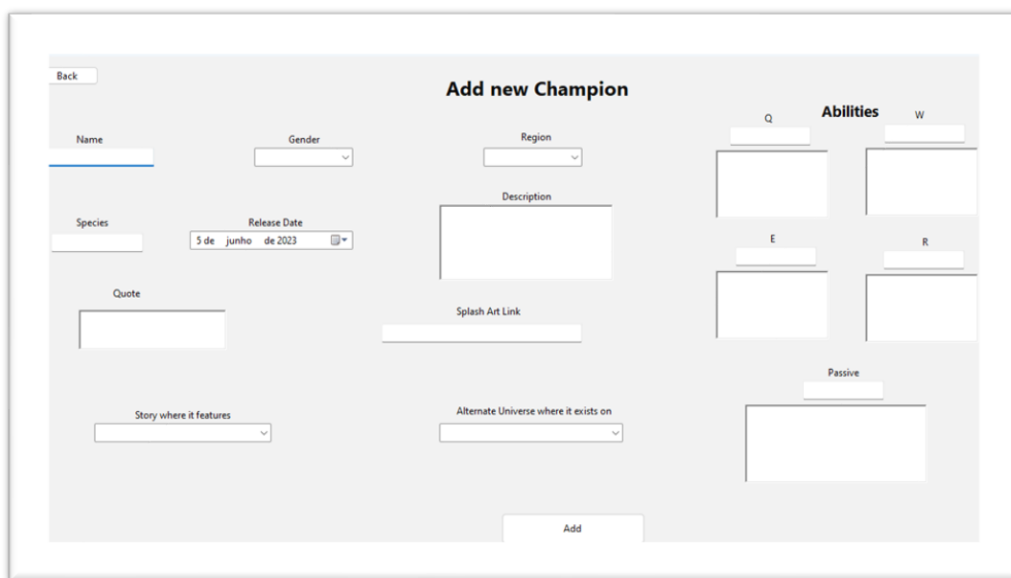
A screenshot of a web browser window titled "Add new Champion". The form is complex with multiple fields. At the top left is a "Back" button. The title "Add new Champion" is centered. The form includes: "Name" (text input), "Gender" (dropdown), "Region" (dropdown), "Species" (text input), "Release Date" (date picker showing "5 de junho de 2023"), "Description" (text area), "Quote" (text input), "Story where it features" (dropdown), "Alternate Universe where it exists on" (dropdown), "Splash Art Link" (text input), "Abilities" section with four sub-inputs labeled "Q", "W", "E", and "R", and a "Passive" section with a text input. An "Add" button is at the bottom center.

Figure 11: Add Champion Form

6.2.2 AddStory

`SELECT name FROM Alternate_Universe` - fills the universes dropdown with universe names

`SELECT name FROM Champion` - fills the champions list with champion names
Adds a Story to the database using a procedure

Back

Add Story

Title Type Author

Participating champions

- ☐ Aatrox
- ☐ Ahri
- ☐ Akali
- ☐ Akshan
- ☐ Alistar
- ☐ Amumu
- ☐ Anivia
- ☐ Annie
- ☐ Aphelios

Universe Name Link

Reset Save

Figure 12: Add Story Form

6.2.3 AddUniverse

`SELECT name FROM Champion` - fill Champions list with champion names
Adds an Alternate_Universe to the database using a procedure
Adds a ExistsOn to the database using a procedure

Back

Add Universe

Name Skin Line Year Created

Existing champions

- ☐ Aatrox
- ☐ Ahri
- ☐ Akali
- ☐ Akshan
- ☐ Alistar
- ☐ Amumu
- ☐ Anivia
- ☐ Annie

Art Link

Reset Save

Figure 13: Add Universe Form

6.2.4 CreateAdmin

Inserts a new admin to the database using a procedure

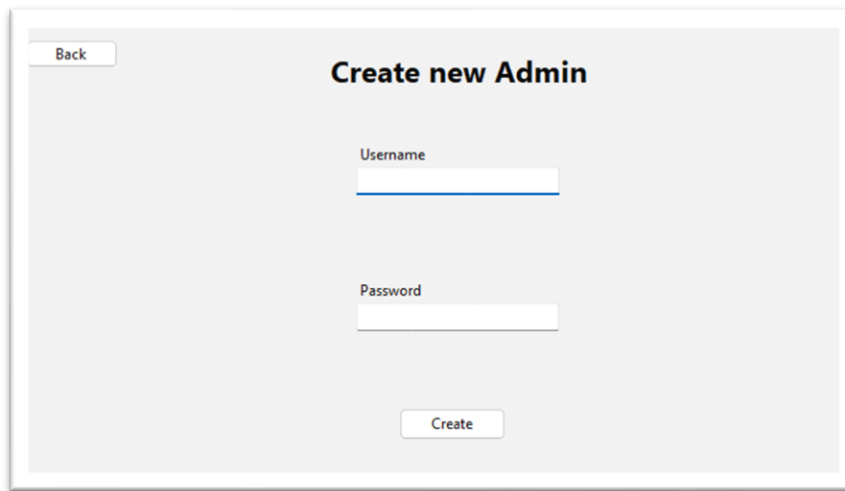
A web form titled "Create new Admin" with a "Back" button in the top left. It contains two input fields: "Username" and "Password". Below the "Password" field is a "Create" button.

Figure 14: Create Admin Form

6.3.1 ManageChampions

`SELECT name FROM Champion` - fills the champions list with champion names
Can update and delete a champion using procedures

`SELECT name FROM Region` - fills the regions dropdown with region names

`SELECT * FROM Champion WHERE Name = @ChampionName` - Show the selected champion's data

`SELECT * FROM Abilities WHERE champion_name = @ChampionName` - show the selected champion's abilities
Can update the selected champion's data using a procedure

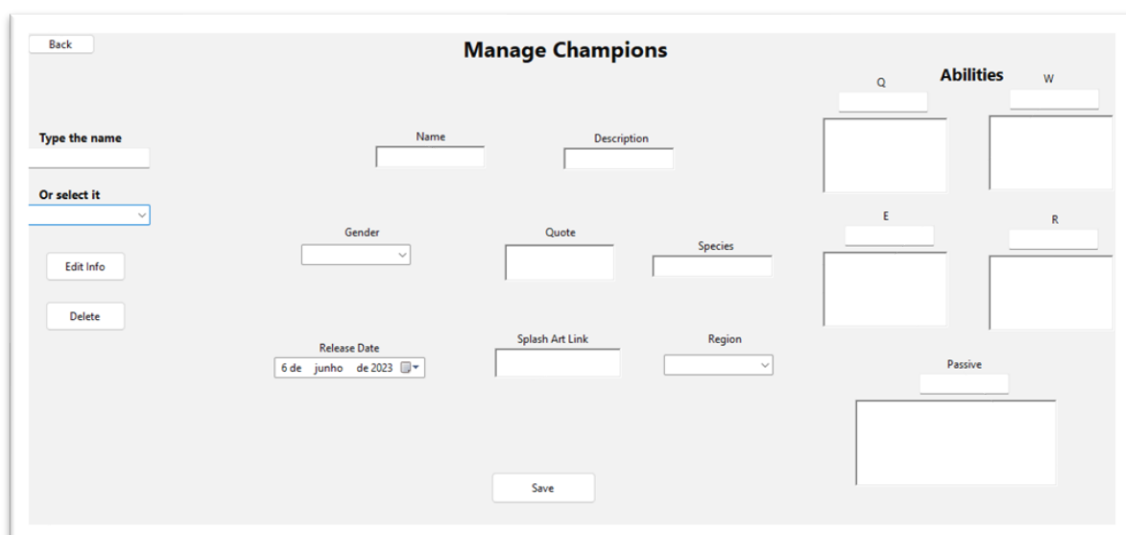
A complex web form titled "Manage Champions". On the left, there's a "Back" button, a "Type the name" input field, an "Or select it" dropdown, and "Edit Info" and "Delete" buttons. The main area contains several input fields: "Name", "Description", "Gender" (a dropdown), "Quote", "Species", "Release Date" (a date picker showing "6 de junho de 2023"), "Splash Art Link", and "Region" (a dropdown). At the bottom center is a "Save" button. On the right, under the heading "Abilities", there are four input fields labeled "Q", "W", "E", and "R", and a "Passive" input field at the bottom.

Figure 15: Manage Champion Form

6.3.2 ManageRegions

`SELECT name FROM Champion` – fills the champions list with champion names

`SELECT emblem FROM Region WHERE NAME='{comboBoxRegions.SelectedItem.ToString()}'`
– Show the emblem of the selected region

Can update the selected Region's data using a procedure

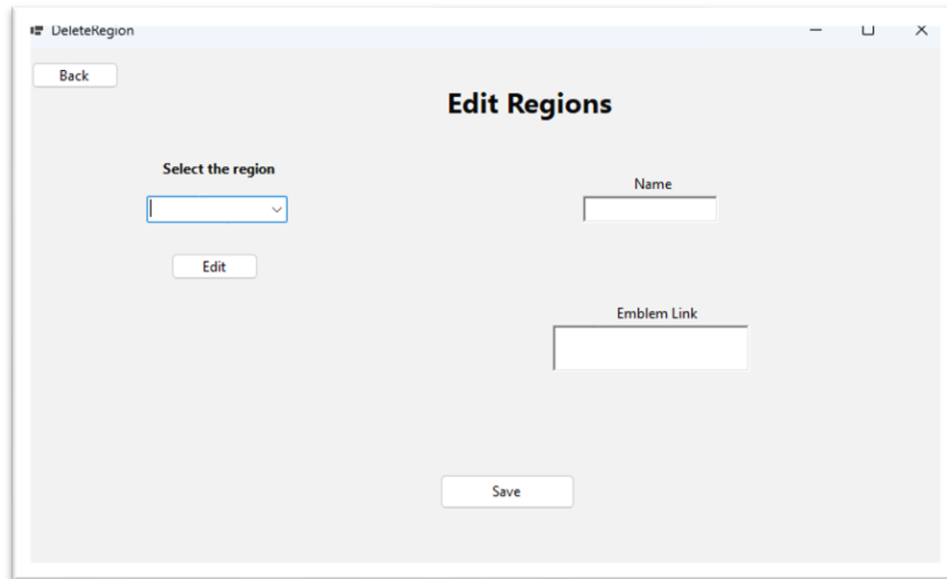
The screenshot shows a Windows application window titled "DeleteRegion". Inside the window, there is a form titled "Edit Regions". At the top left of the form is a "Back" button. Below it, on the left side, is a section labeled "Select the region" containing a dropdown menu and an "Edit" button. On the right side, there are two text input fields: "Name" and "Emblem Link". At the bottom center of the form is a "Save" button.

Figure 16: Edit Regions' Form

6.3.3 ManageStories

`SELECT title FROM Stories` – fills the stories list with story names

Can update and delete stories using procedures

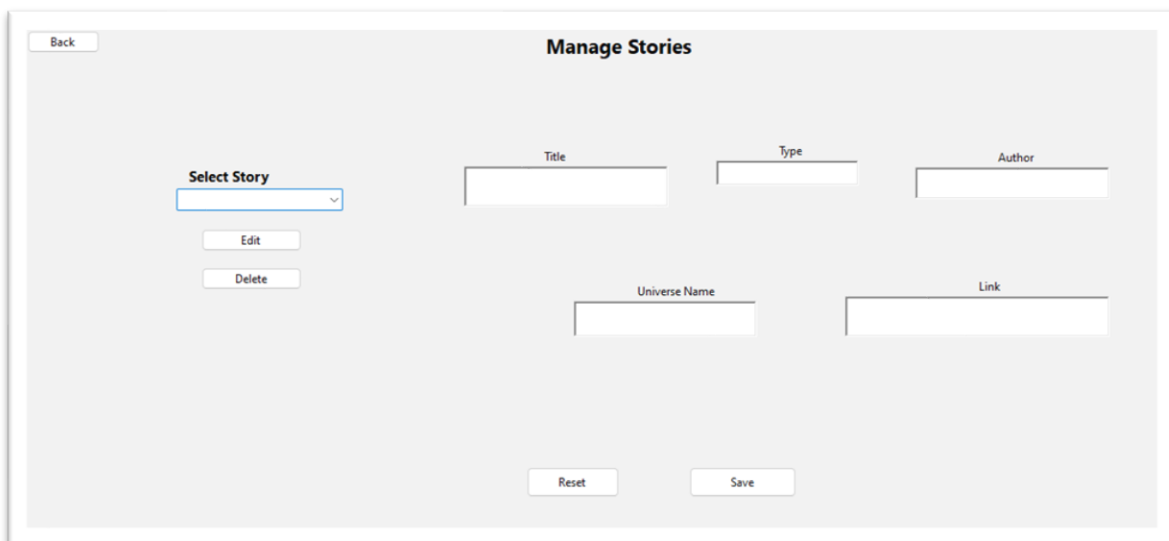
The screenshot shows a form titled "Manage Stories". At the top left is a "Back" button. Below it, on the left, is a section labeled "Select Story" with a dropdown menu, an "Edit" button, and a "Delete" button. To the right of this section are three text input fields: "Title", "Type", and "Author". Below these are two more text input fields: "Universe Name" and "Link". At the bottom center are two buttons: "Reset" and "Save".

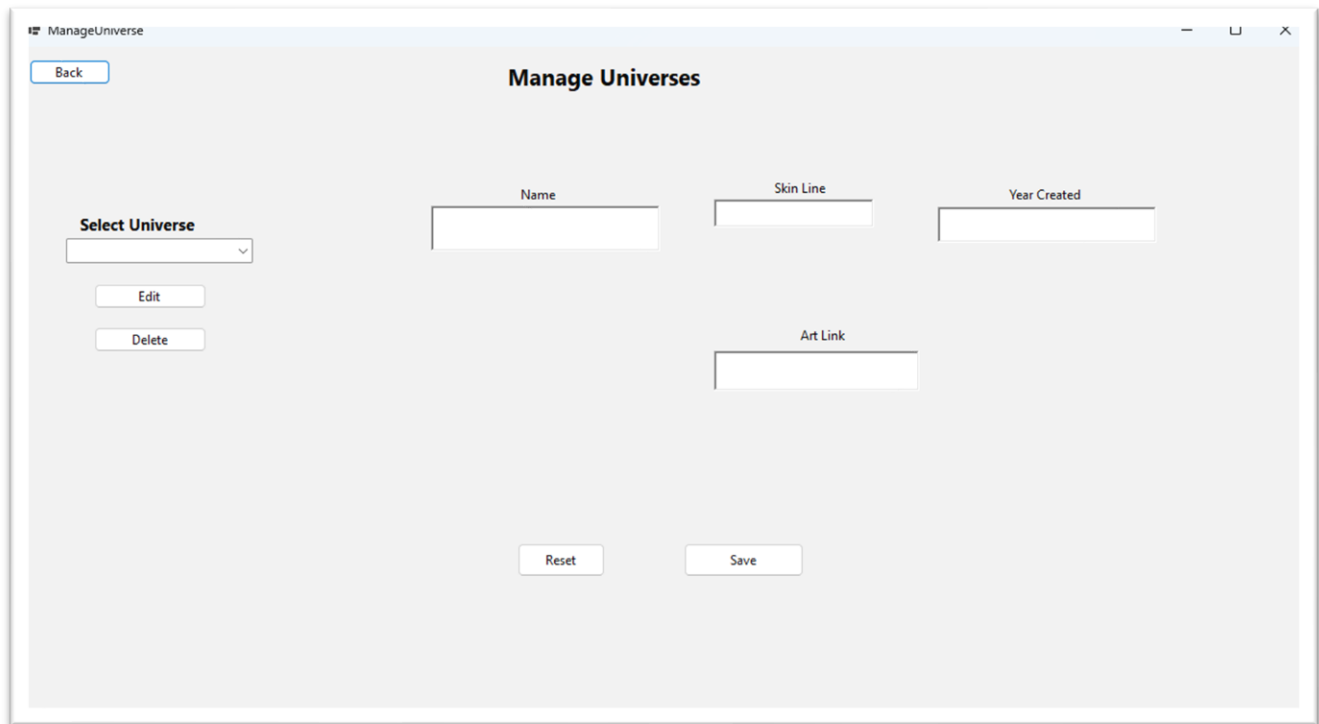
Figure 17: Edit Stories' Form

6.3.4 ManageUniverses

`SELECT name FROM Alternate_Universe` – fills the universe dropdown with alternate_universes

`SELECT * FROM Alternate_Universe WHERE name = @ChampionName` – shows the selected alternate_universe data

Can update and delete Alternate_Universes using procedures



The screenshot shows a web application window titled "ManageUniverses". Inside the window, the main heading is "Manage Universes". In the top-left corner, there is a "Back" button. On the left side, there is a section titled "Select Universe" containing a dropdown menu. Below the dropdown are two buttons: "Edit" and "Delete". The main form area contains several input fields: "Name", "Skin Line", "Year Created", and "Art Link". Each of these fields has a corresponding text input box. At the bottom of the form, there are two buttons: "Reset" and "Save".

Figure 18: Edit Universes' Form

7. Normalization

After some analysis we concluded that our data model does not need any modifications because it is already normalized. Each table has a primary key to uniquely identify each record and each column in a table contains atomic values.

8. Stored Procedures

All the stored procedures are located in the `02_sp_functions` folder.

Several stored procedures were used in our project. They are the only way we insert (e.g. AddChampion), remove (e.g. DeleteChampion) and update (e.g. UpdateChampion) data in the database.

There is an additional procedure (FilterChampions) that is used to filter champions by region and/or sex.

9. Indexes

We decided to use an index to improve the performance of the queries that filter or search a Champion by its name.

It is located on the `2_idxChampName.sql` file.

10. Notes

The file containing the initial data for the database is located in the `04_db_init` folder.

The `admin account` credentials to use in the forms are

Username: Admin

Password: BD2023

Change database user on the `Forms/LoL Forms/Program.cs` file, line 29