Full Stack Sport and Fixture Management Application

Final Project Report

1. Introduction

This report outlines the development and implementation of the Sport and Fixture Management Application, created as a final project for the course BLM19417E Web Design and Programming. The primary goal of the project was to design a web-based application using React for the frontend, ASP.NET Core for the backend Web API, and SQL Server as the database. The application enables users to manage sports teams, players, and fixtures, providing full CRUD (Create, Read, Update, Delete) functionality.

Technologies Used

- Frontend: React (with React Hooks, Node.js, Next.js)
- Backend: ASP.NET Core Web API
- Database: SQL Server
- State Management: Redux
- Routing: Next.js built-in routing system

---

2. Data Model

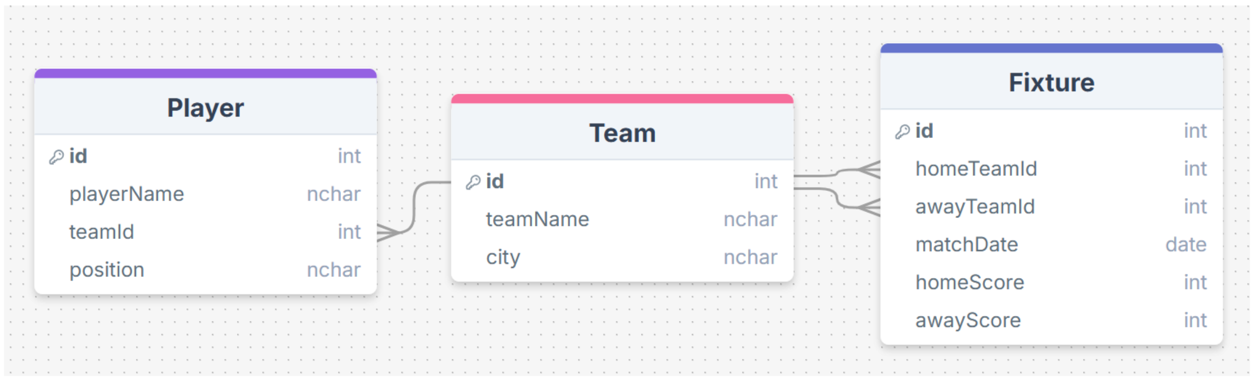
The database model consists of three primary tables:

1. Teams: Stores information about teams, including their names and cities.
   - Fields: Id, TeamName, City
2. Players: Stores player details associated with specific teams.
   - Fields: Id, FullName, Position, TeamId
   - Foreign Key: TeamId references Teams(Id)
3. Fixtures: Stores fixture details including the participating teams and scores.
   - Fields: Id, HomeTeamId, AwayTeamId, HomeTeamScore, AwayTeamScore, MatchDate
   - Foreign Keys: HomeTeamId and AwayTeamId both reference Teams(Id)

The relationships are as follows:

- A Team can have multiple Players.
- A Fixture involves two Teams (Home and Away).

Database Model Diagram



---

3. Application Features

CRUD Operation Support

The application supports full CRUD operations for Teams, Players, and Fixtures through a Web API.

- Create: New teams, players, and fixtures can be added using dedicated form pages.
- Read: Data is displayed in HTML tables on respective pages for teams, players, and fixtures.
- Update: Existing records can be edited through "Edit" pages.
- Delete: Records can be deleted after confirmation, with error handling for dependent data.

Data Entry Form (Local State and Props)

The "Add Team" and "Add Player" pages utilize local state (useState) and props to manage form data and handle user input.

Lookup Field (Combo Box)

On the "Add Fixture" page, a combo box is used to select teams by displaying their names while returning their IDs.

Sum Calculation and Display

On the Team Details page, the application calculates and displays the total number of matches played, wins, losses, draws, and not-played fixtures for the selected team.

Status Message Using Redux

Status messages (e.g., "Saved", "Error", "Not Changed") are displayed using Redux. Messages automatically disappear after a few seconds.

Simple Validations

Basic validations are implemented to ensure that required fields are filled before form submission.

Menu and Routing

A navigation menu is provided at the top of the application, enabling users to switch between the Teams, Players, and Fixtures pages. Routing is handled using Next.js's built-in routing mechanism.

Web Service Call and Context Storage

The application makes web service calls to fetch data from the backend and stores the data in Redux, which acts as a centralized context.

React Hooks Used

The following React Hooks are used throughout the application:

- useState: To manage local state in form components.
- useEffect: To handle side effects, such as fetching data from the API.
- useMemo: To optimize performance by memoizing derived data, such as position colors.
- useSelector and useDispatch: For interacting with the Redux store.

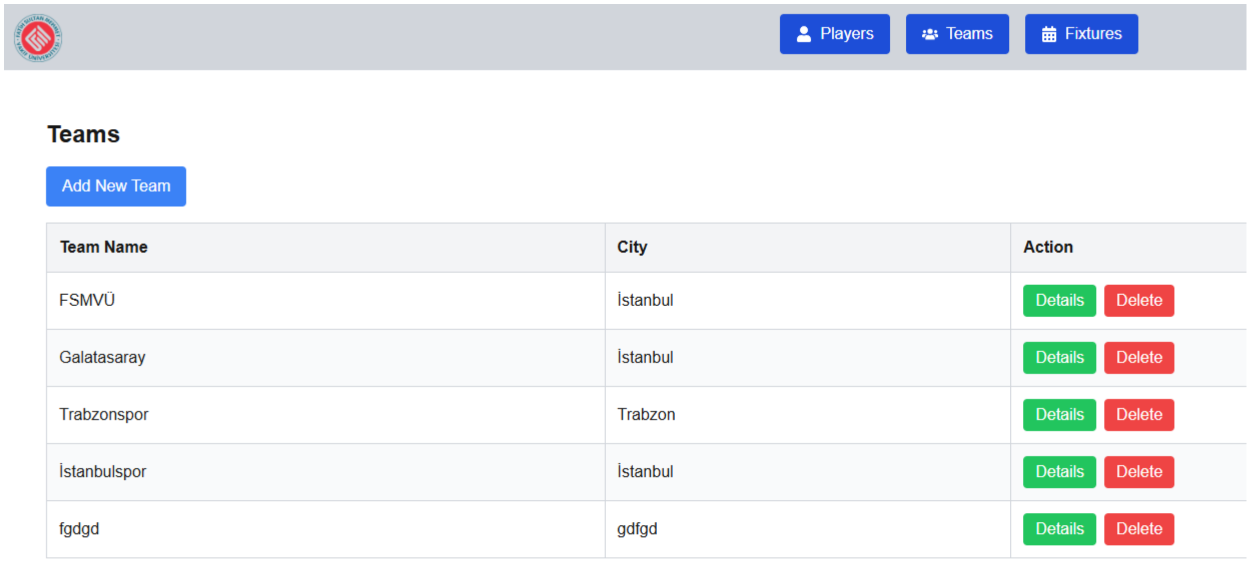
---

4. Frontend Development

Teams Page

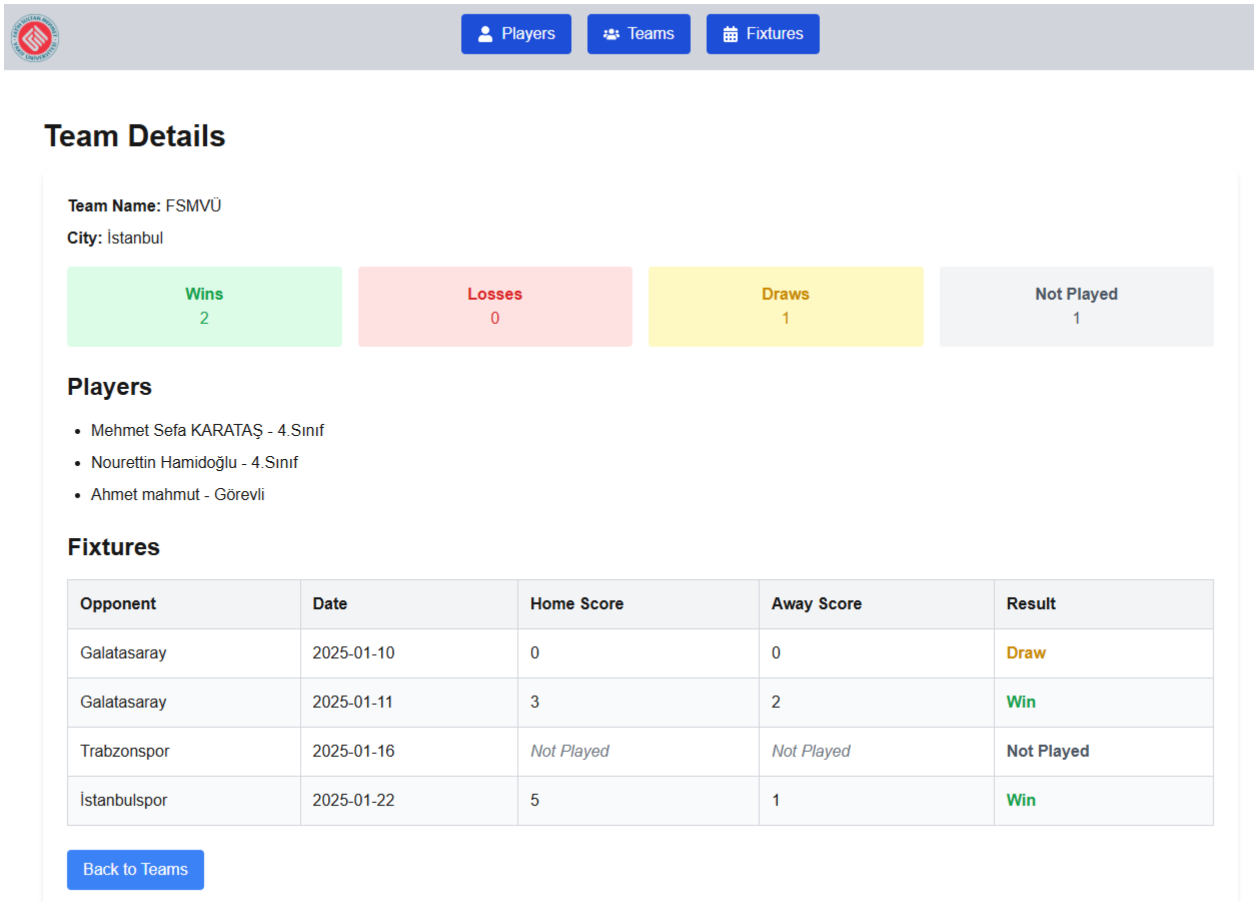
- Displays a list of teams in an HTML table.
- Provides buttons to view details, edit, or delete a team.

- Implements status messages using Redux.
- Example screenshot:



Teams

Team Name	City	Action
FSMVÜ	İstanbul	Details Delete
Galatasaray	İstanbul	Details Delete
Trabzonspor	Trabzon	Details Delete
İstanbulspor	İstanbul	Details Delete
fgdgd	gdfgd	Details Delete



Team Details

Team Name: FSMVÜ
City: İstanbul

Wins	Losses	Draws	Not Played
2	0	1	1

Players

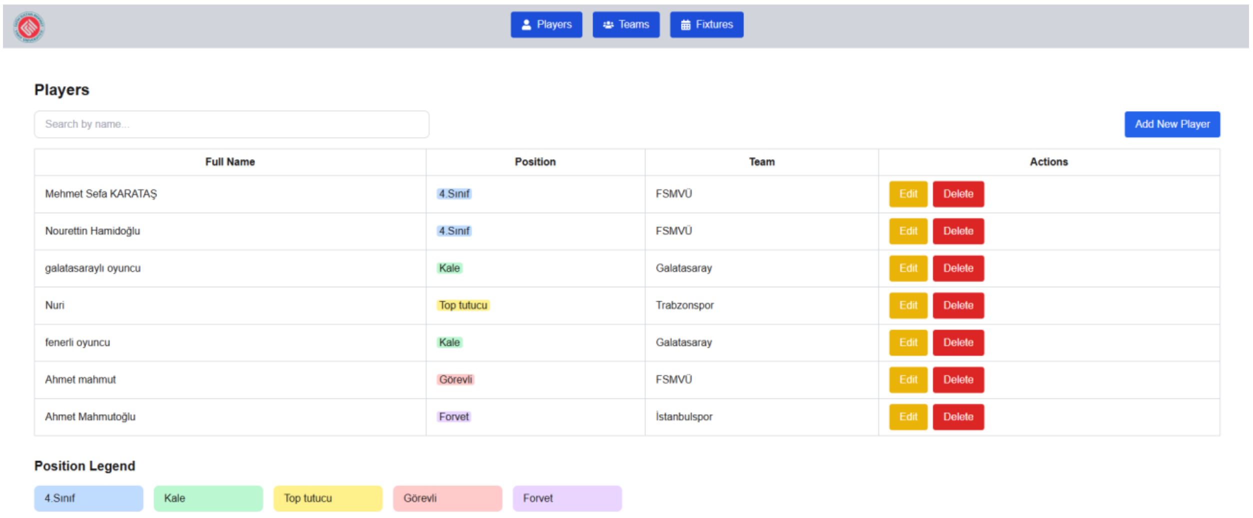
- Mehmet Sefa KARATAŞ - 4.Sınıf
- Nourettin Hamidoğlu - 4.Sınıf
- Ahmet mahmut - Görevli

Fixtures

Opponent	Date	Home Score	Away Score	Result
Galatasaray	2025-01-10	0	0	Draw
Galatasaray	2025-01-11	3	2	Win
Trabzonspor	2025-01-16	*Not Played*	*Not Played*	Not Played
İstanbulspor	2025-01-22	5	1	Win

Players Page

- Displays a list of players with their positions and associated teams.
- Provides a search feature to filter players by name.
- Example screenshot:



Players

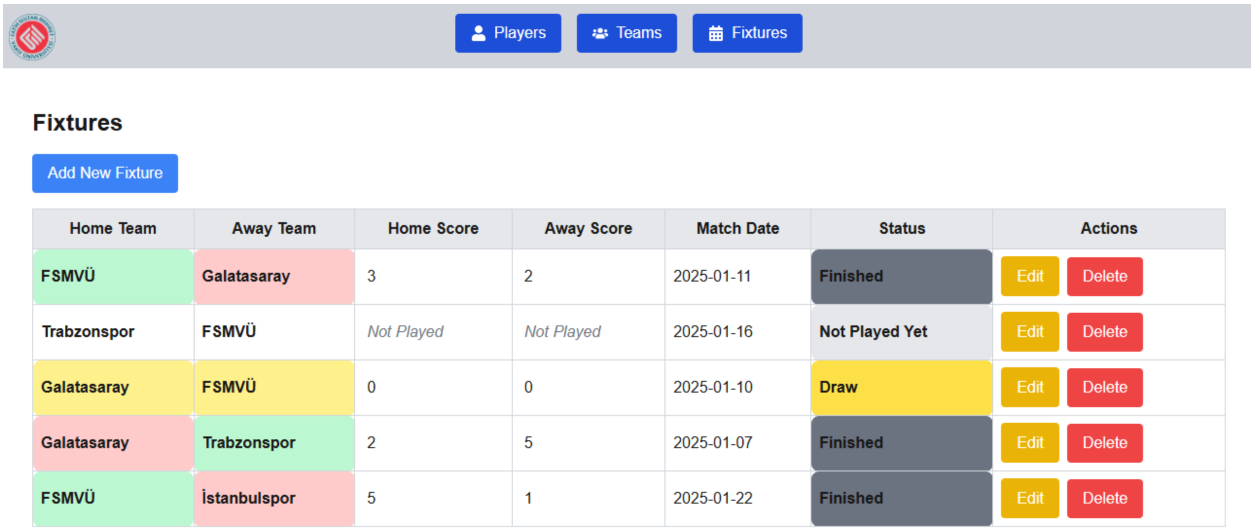
Full Name	Position	Team	Actions
Mehmet Sefa KARATAŞ	4.Sınıf	FSMVÜ	Edit Delete
Nourettin Hamidoğlu	4.Sınıf	FSMVÜ	Edit Delete
galatasaraylı oyuncu	Kale	Galatasaray	Edit Delete
Nuri	Top tutucu	Trabzonspor	Edit Delete
fenerli oyuncu	Kale	Galatasaray	Edit Delete
Ahmet mahmut	Görevli	FSMVÜ	Edit Delete
Ahmet Mahmutoğlu	Forvet	İstanbulspor	Edit Delete

Position Legend

4.Sınıf Kale Top tutucu Görevli Forvet

Fixtures Page

- Displays a list of fixtures, including the participating teams and scores.
- Implements color-coded status for fixtures (e.g., "Not Played", "Draw").
- Example screenshot:



Fixtures

Home Team	Away Team	Home Score	Away Score	Match Date	Status	Actions
FSMVÜ	Galatasaray	3	2	2025-01-11	Finished	Edit Delete
Trabzonspor	FSMVÜ	*Not Played*	*Not Played*	2025-01-16	Not Played Yet	Edit Delete
Galatasaray	FSMVÜ	0	0	2025-01-10	Draw	Edit Delete
Galatasaray	Trabzonspor	2	5	2025-01-07	Finished	Edit Delete
FSMVÜ	İstanbulspor	5	1	2025-01-22	Finished	Edit Delete

5. Backend Development

The backend was developed using ASP.NET Core Web API. The following endpoints were implemented:

- GET /api/Teams: Retrieves the list of teams.
- GET /api/Teams/{id}: Retrieves details of a specific team, including associated players and fixtures.
- POST /api/Teams: Adds a new team.
- PUT /api/Teams/{id}: Updates an existing team.
- DELETE /api/Teams/{id}: Deletes a team if it has no associated players or fixtures.

Similar endpoints were created for Players and Fixtures.

---

6. Testing and Results

The application was tested extensively to ensure proper functionality. Screenshots of different pages and operations are provided below:

- Teams Page *(Teams.png)*
- Team Details Page *(TeamDetails.png)*
- Players Page *(Players.png)*
- Edit Fixture Page *(EditFixture.png)*
- Delete Player Confirmation *(PlayerDelete.png)*
- Fixtures Page *(Fixtures.png)*

All CRUD operations were tested, and appropriate status messages were displayed during each operation.

---

7. Conclusion and Evaluation

The Sport and Fixture Management Application successfully meets all the requirements outlined in the project description. The use of React, ASP.NET Core Web API, and SQL Server ensured a robust and scalable solution. Key features such as CRUD operations, status messages using Redux, and dynamic form handling were implemented effectively.

Through this project, the following learning outcomes were achieved:

- Hands-on experience with full-stack web development.
- Understanding of React Hooks, Redux, and ASP.NET Core.
- Implementation of a relational database model and its interaction with a Web API.

The project is ready for deployment and can be further extended with additional features, such as user authentication and role-based access control.

Mehmet Sefa KARATAŞ **2021221008**