

Computer Project I – Project Document

Basketball Statistics Manager

Introduction

This project is built during Computer Project I course of Istanbul Technical University to help users creating basketball game statistics. The main goal of the application is creating basketball game between two parties and constantly entering game data. Current version of the app allows you selecting available teams, which are **Türk Telekom, Darüşşafaka Lassa, Pınar Karşıyaka, Anadolu Efes, Fenerbahçe Beko and Yukatel Merkezefendi Belediyesi Basket**, simulate a match between them.

Project Requirements

User types

- **User:** End-user utilizing the Basketball statistics application to visualize and enter basketball match data.

Technical Requirements

The technical encompass the specific criteria and attributes essential for the effective execution and operation of the project. These criteria outline the technological elements of the project, guaranteeing its alignment with targeted performance, functionality, usability, and compatibility objectives.

Number	User Story	Requirement
1	As a user, I want to list the previously played basketball matches.	The system must provide and interface for users to display the previously created and finished matches.
2	As a user, I want to add a new match entry to the match list.	The system should allow user to easily create a new match entity from the user interface.
3	As a user, I want to display the statistics for a single match.	The user interface should allow users to see the match statistics for each player in home and away teams.
4	As a user, I want to display the coordinates of the shoots which happened in each match.	The user interface should display all the shooting positions that happened during a game in one screen.

5	As a user, I want to display the timeline of a match.	The system must provide a page where events in a single game is displayed in order.
6	As a user, I want to enter new data to the created match.	The user interface should allow users adding new data for the matches
7	As a user, I want to add/delete teams to/from the team list of the app	The teams should be available to participate in matches with the current squad they have
8	As a user, I want to add/delete players to/from the player list of the app	The users should choose the team they want to edit and can add/remove player from the list

Non-technical requirements

Non-technical requirements of a project pertain to the facets of the project that are not directly associated with its technical specifications or functionality.

Number	Type	Requirement
1	UI/UX	As a user, I want to be provided with a UI that simplifies the basketball data creation app simpler.
2	Compatibility	As a user, I should be able to enter the app on my computer, without any problems on various browsers.
3	Portability	It is not required to support the mobile devices and app should not be portable in mobile application level.

User's Guide

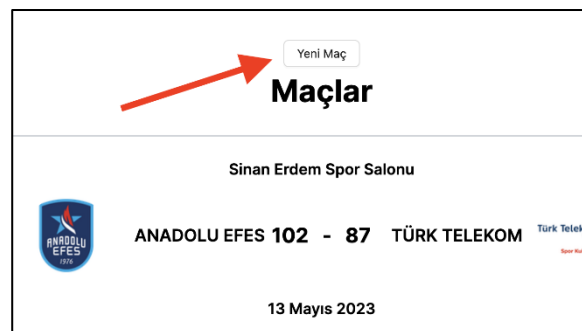
1. Listing matches

You can list the matches that have been played in the past in the first screen of the app. The list gives the information about match competitors, match state, match date and location of the event.

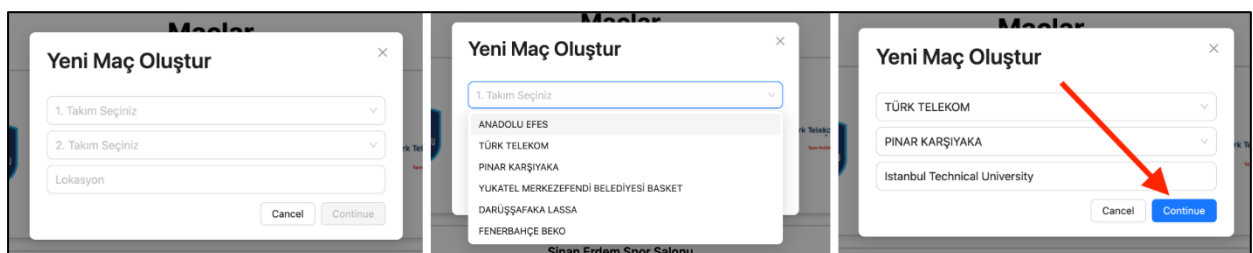


2. Creating a match

You can create a new match by pressing “Yeni Maç” button on the top of the dashboard page.



This button opens a modal for you to choose the parties of newly created match. You can choose the home and away teams to continue. You can also enter the match location to be displayed in the dashboard page. **Currently, creating new teams is not supported in the app.**




3. Displaying match data

The information related the match is visible when clicked to each element of the list in the dashboard. There are three main sections in the match page, which are **Statistics, Shooting Graph and Timeline.**

Statistics

Statistics is the page where broad information about each player is displayed. The match statistics related to shooting, free throws, rebounds, steals, fouls and blocks are displayed accordingly for home and away teams.

ANADOLU EFES



102 - 87

C1 - 26 - 19
C2 - 19 - 18
C3 - 34 - 13
C4 - 23 - 37

Türk Telekom
Türk Telekom Logo

TÜRK TELEKOM

İstatistikler

Atış Grafliği

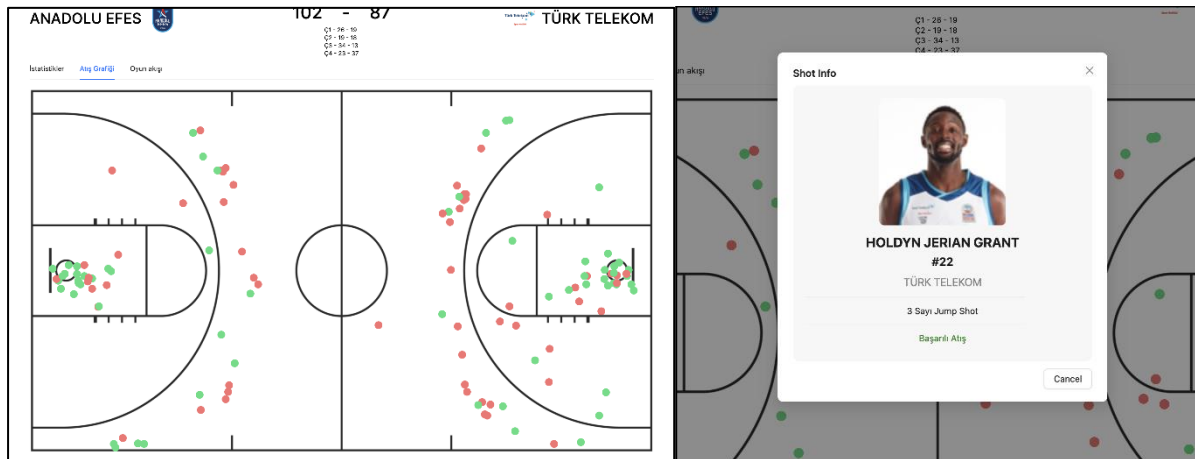
Oyun akışı

Ev Sahibi

#	Name	2SB	2SD	25%	3SB	3SD	35%	BSA	SA	SA%	HR	SR	TÇ	BL	FA	PT
14	FURKAN HALTALI	0	0		0	0		0	0		3	3	3	0	11	0
0	DESHANE DAVIS LARKIN	2	5	90.9090909090909	11	11	40	6	8	75	0	8	3	0	5	NAN
17	MEHMET EFE DEMIREL	0	0		0	1	0	0	0		0	0	0	0	2	0
22	VASKLJE MICIC	11	13	84.61538461538461	6	6	66.66667	2	2	100	0	4	2	0	3	40
19	AHMET BUĞRAHAN TUNCER	0	2	85.71428571428571	7	7	33.33333	0	0		0	6	0	0	1	8
1	RODRIGUE BEAUBOIS	2	3	100	11	11	66.66667	2	2	100	0	6	0	3	1	43
5	KARAHAN TUAN EFE OĞLU							0							0	0
6	ELLIAH BRIGHAM BRYANT	7	12	88.88888888888889	9	9	25	8	8	100	0	7	4	0	4	30
12	WILL CLYBURN	9	17	100	13	13	33.33333	10	10	100	5	2	12	0	10	44
41	ANTE TONI ZIZIC	11	13	84.61538461538461	0	0		20	25	80	1	7	4	1	12	NAN

Shooting Graph


This section is one of the fanciest pages of the application, where all shooting statistics are displayed. You are able to see the shoot details by pressing to each circle, which are located on top of the stadium.



Timeline

In this section, you are able to see all game actions in chronological order for each quarter. This helps you follow the game from very beginning until the end and see what is going on.

ANADOLU EFES



Maçlar


102 - 87

Q1 - 26 - 19

Q2 - 19 - 18

Q3 - 34 - 13

Q4 - 23 - 37

TÜRK TELEKOM

İstatistikler

Atış Grafiği

Oyun akışı

Q1


Q2

Q3

Q4

Tümü

Oyundan Çıkan


RODRIGUE BEAUBOIS

26

Kalan süre: 10M05

19

Oyuna Giren


DESHANE DAVIS LARKİN

26

Kalan süre: 10M05

19

Top Kaybı - Kötü Pas


DESHANE DAVIS LARKİN

26

Kalan süre: 9M55S

19

Top Çalma


NATHAN MICHAEL SESTINA

26

Kalan süre: 9M55S

19

2 Sayı Layup


NATHAN MICHAEL SESTINA

26

Kalan süre: 9M45S

21

Asist

TONY CHRISTOPHER TAYLOR

26

Kalan süre: 9M45S

21

4. Entering new match data

Users are able to provide new match data to the newly created games. From section 2, we saw the guide about creating a match. When you press the match link and open the related page, you will see “Veri Girişi” button on top of the page. This page is designed to enter the match data as fast as possible.

Firstly, you need to enter the location of the event by selecting the coordinates on the map. This coordinate indicates the location of action in the stadium. The next step is selecting the Event type (**two-point, three-point, free throw, attack rebound, defence rebound, steal, block, and foul**), the actor (player from one of the participating teams). Period and time data will be calculated automatically according to clock.

Veri Girişi

İki Sayı Üç Sayı Serbest Atış Hücüm Ribaudu Savunma Ribaudu Top Çalma Blok Faul

ANADOLU EFES

14 - FURKAN HALTALI 0 - DESHANE DAVIS LARKIN 17 - MEHMET EFE DEMIREL

22 - VASILJE MICIĆ 19 - AHMET BUĞRAHAN TUNCER

DARÜŞŞAFAKA LASSA

12 - CANBERK KUŞ 22 - HAKAN SAYILI 8 - CAN KORKMAZ

3 - ERAY BÜYÜKGANGAZ 15 - AKWASI YEMOAH

Geri İleri

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
1 RODRIGUE BEAUSOIS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 KARAHAN TUAN EFEOĞLU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6 ELLIAH BRIGHAM BRYANT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12 WILL CLYBURN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Once you are done, you can press the primary button at the bottom of the modal to add data. To instantly add a new data, you will be directly navigated to coordinate selection step, to continue adding new data. Once you are done, you can quit the menu and see the added data on pages which are described at section 3 of this document.

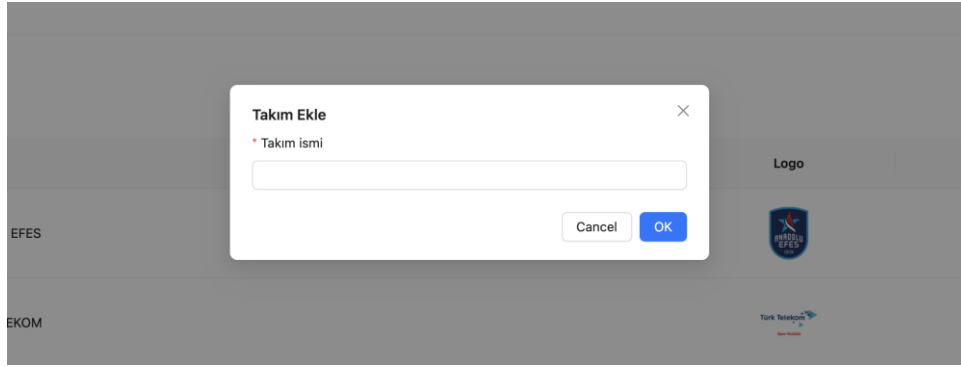
4. Adding/Removing teams

All the existing teams is accessible from “TEAMS” section on top of the page. You are able to press the “Takım Ekle” button and add new teams. Also, you can delete the team by pressing the danger button on the right column of the table.

Takımlar

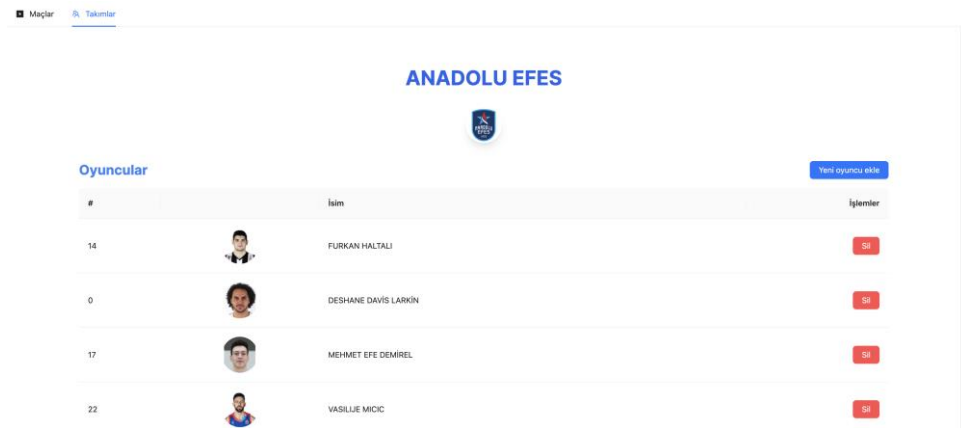
Takım Ekle

#	İsim	Logo	İşlemler
0	ANADOLU EFES		Sil
1	TÜRK TELEKOM		Sil
2	PINAR KARŞIYAKA		Sil
3	YUKATEL MERKEZEFENDİ BELEDİYESİ BASKET		Sil
4	DARÜŞŞAFAKA LASSA		Sil



5. Adding new players

You can press the team name (marked as blue) from the Teams section and navigate to team-specific edit page where players can be added or removed. The same flow applies here. You can create new players by pressing the primary button and remove players using the danger button from the table.



Developer's Guide

1. Data store

We have used the database from Turkish Basketball Federation (TBF) during this project. Although there is not any public dataset provided from the TBF, we scrapped the data from the website to download multiple match data, including timeline, statistics and shooting table. Here is an example match from TBF website which does the similar to our project.

https://www.tbf.org.tr/statistics.html?%7Ew=f%7EeJwlyz0OgCAMQOGrkM42AdoKeAzjBfgpk5O6Ge9u0PEI77vhhMWA5tK6OEby1aJz2rAIJ_RifY2RUnMJJgP7mK8Dt3VU_2gJxEHtoPTTrEyYJczkqVOsAZ4XSV0ZsA

2. Example match Data Structure

Here are some examples to structures we scraped and also used in our application to represent matches, events, players, teams and etc.

```
struct Competitor = {  
    String name,  
    String logo,  
    String entityId  
    ...  
}
```

```
struct Fixture = {  
    Competitor[] competitors,  
    String venue,  
    String startTimeLocal,  
    String startTimeUTC,  
    String fixtureId,  
    ...  
}
```

```
struct PersonStats = {  
    Int assists,  
    Int blocks,  
    Float efficiency,  
    Int fieldGoalsAttempted,  
    Int fieldGoalsMade,  
    Int fieldGoalsPercentage,  
    Int foulsDrawn,  
    Int foulsTotal,  
    Int freeThrowsAttempted,  
    Int freeThrowsMade,  
    Float freeThrowsPercentage,  
    Int plusMinus,  
    Int points,
```



```
    Int pointsThreeAttempted,  
    Int pointsThreeMade,  
    Float pointsThreePercentage,  
    Int pointsTwoAttempted,  
    Int pointsTwoMade,  
    Float pointsTwoPercentage,  
    Int rebounds,  
    Int reboundsDefensive,  
    Int reboundsOffensive,  
    Int steals,  
    Int turnovers  
}
```

```
struct Person = {  
    String personId,  
    String personName,  
    String personImage  
    String bib, // Kit number of the player  
    PersonStats statistics,  
    ..  
}
```

```
struct MatchStats = {  
    PersonStats away,  
    PersonStats home,  
    ...  
}
```

```
struct Match = {  
    Fixture fixture,  
    MatchStats statistics  
}
```

3. GitHub Repository

The codebase of our project is public in GitHub repository and can be accessed from the link below:

<https://github.com/asgarovf/blg439-project1>