

# Report - Group 11

## Team

| Name                | Email                       | Student Id |
|---------------------|-----------------------------|------------|
| Vishal Khushlani    | v.khushlani@se22.qmul.ac.uk | 220400556  |
| Chandrima Mukherjee | c.mukherjee@se22.qmul.ac.uk | 220990378  |
| Alisha Khan         | alisha.khan@se22.qmul.ac.uk | 220866925  |
| Mihir Singh         | m.singh@se22.qmul.ac.uk     | 220158082  |

## Introduction

This report has the details of setup and functionality of a stack-based Haskell app that retrieves and displays of all NBA games.

## Source

We are using the data from <https://balldontlie.io/api/v1/games?seasons%5B%5D=> to fetch the data about all NBA games for a given season (e.g. 2022). We pass the season requested by the user as a URL parameter e.g. [?seasons\[\]=2022](#). The Fetch.hs makes a GET request to receive a string (LazyByteString) with JSON formatting which is then parsed in Parse.hs using types from Types.hs.

## Compiling and Running

We need to run the following commands to run the app.

- stack setup
- stack build
- stack run

## How does this app work?

This application displays data about the NBA games for all seasons. Given below are the options available

1. Download data for the a season - This option fetches the data from the given API and stores it in database NBA.sqlite after parsing it. It also stores the data into a json file named NBA.json
2. View all Games for the a season - Displays all games played in the last season.
3. View all Teams in the a season - Displays all teams who played in the last season.

4. Start local server - This command starts a local server with Scotty to retrieve holidays from the API.
5. Exit - To exit the interactive terminal

## Database

The data is stored in two tables called "Games" and "Teams" in the database. The "Games" and "Teams" tables have a Many-to-One relationship. Since one team has played many games so we store teams and games different to avoid data redundancy.

## Haddock Documentation

We generate Haddock documentation for this project by executing the following command.

```
stack exec -- haddock --html app/Main.hs src/Database.hs src/Fetch.hs src/Parse.hs  
src/Types.hs src/WebAPI.hs --hyperlinked-source --odir=dist/docs
```

## Modules

- **Main.hs** - This is the main module where the interactive CLI is written. This module calls all other modules.
- **Database.hs** - This module creates tables, handles making database connections, and handles adding and retrieving data from tables.
- **Fetch.hs** - This module assists with sending an HTTP request to the specified URL and returns the data body of the response in Byte String format.
- **Parse.hs** - With the help of this module, data in Byte String format can be converted to a specified Haskell data type.
- **Type.hs** - This module contains the Haskell datatypes to be used and stored in the app.
- **WebAPI.hs** - This module has a simple feature for making an API request using Scotty to fetch data.

## Extra Feature

For retrieving fullname and name for teams whose matches id of home teams in games for a particular season, a straightforward web API is created using the Scotty package. Start it by launching the application and selecting option 4.

**URL:** localhost:3000/games/:season

**METHOD:** GET

**PARAMS:**

**season** - Any year whose data you have downloaded and want to view.

**sample request URL** : <http://localhost:3000/games/2021>

**sample output** :

```
1 [{"date_": "2022-10-22T00:00:00.000Z", "home_team_fk_": 16, "home_team_score_": 112, "period_": 4, "season_": 2022, "status_": "Final", "visitor_team_fk_": 28, "visitor_team_score_": 109}, {"date_": "2022-10-23T00:00:00.000Z", "home_team_fk_": 14, "home_team_score_": 104, "period_": 4, "season_": 2022, "status_": "Final", "visitor_team_fk_": 25, "visitor_team_score_": 106}, {"date_": "2022-10-23T00:00:00.000Z", "home_team_fk_": 21, "home_team_score_": 106, "period_": 4, "season_": 2022, "status_": "Final", "visitor_team_fk_": 18, "visitor_team_score_": 116}, {"date_": "2022-10-23T00:00:00.000Z", "home_team_fk_": 19, "home_team_score_": 121, "period_": 5, "season_": 2022, "status_": "Final", "visitor_team_fk_": 29, "visitor_team_score_": 122}]
```

## Github URL

<https://github.qmul.ac.uk/ec22151/haskell-project>

## References

<http://learnyouahaskell.com/chapters>

<https://haskell-haddock.readthedocs.io/en/latest/markup.html>

<https://gaumala.com/posts/2018-09-12-creating-an-http-api-with-scotty-and-beam.html>