

# **Software Capstone Final Project Report**

## **Bet Tracker**

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## Project Background/Description

This web app will allow users to log bets (or just guesses if one is not inclined to bet) on NHL games. Sports bettors need a way to keep track of what they are betting (or guessing) on and their profit/loss and accuracy. This application is an electronic log that will allow users to record their bets and money placed on the outcome of major league sporting events based on their sportsbook's odds. This is useful for someone who wants more functionality than what a simple spreadsheet can offer.

## Functionality Chart

#	Feature	User (Role 1)	Admin (Role 2)	Complete?
-	CRUD on NHL games (main collection):			-
1	- Create new NHL game bet/guess [View Games]			Y
2	- View NHL games bet/guessed on [My Bets]			Y
3	o Search on any field			Y
4	o <del>Search on range</del> (moved – not useful here)	X		N
5	o Display tabled/grid with pagination			Y
6	- Update NHL game bet/guessed on [My Bets]			Y
7	- Delete NHL game bet/guessed on [My Bets]			Y
8	Report of games guessed based on date range [Statistics/My Bets Report]			Y
	- Search fields (added)	X		Y
	- Search ranges (added)			Y
	- Display tabled/grid with pagination (added)			Y
9	Chart to show guessing accuracy over date range [Statistics/AccuracyChart]	X		Y
10	Chart to show money profit/loss over date range [Statistics/ProfitLossChart]	X		Y
-	'Favourite' Teams view [Favourites]:			-
11	- List teams and have ability to designate as favourite	X		Y
12	- Display next 5 games for favourite teams			Y
-	Site metrics/charts [Statistics/SiteMetrics]:			-
13	- Number of users		X	Y
14	- Number of bets/guesses made			Y
15	- Accuracy of bets/guesses made			Y
16	Automatically fetch NHL game data (the event information) [View Games]		X	Y
17	<del>Ability to manually modify NHL game data</del> (incomplete – just another Update action with not a lot of benefit)		X	N

## Functionality proposed but replaced

- Some user features were moved to different areas of the application (to be more useful)

## Functionality proposed but not completely developed

- One admin feature was not implemented (it was not very useful)

## Summary of Functionality (Screenshots)

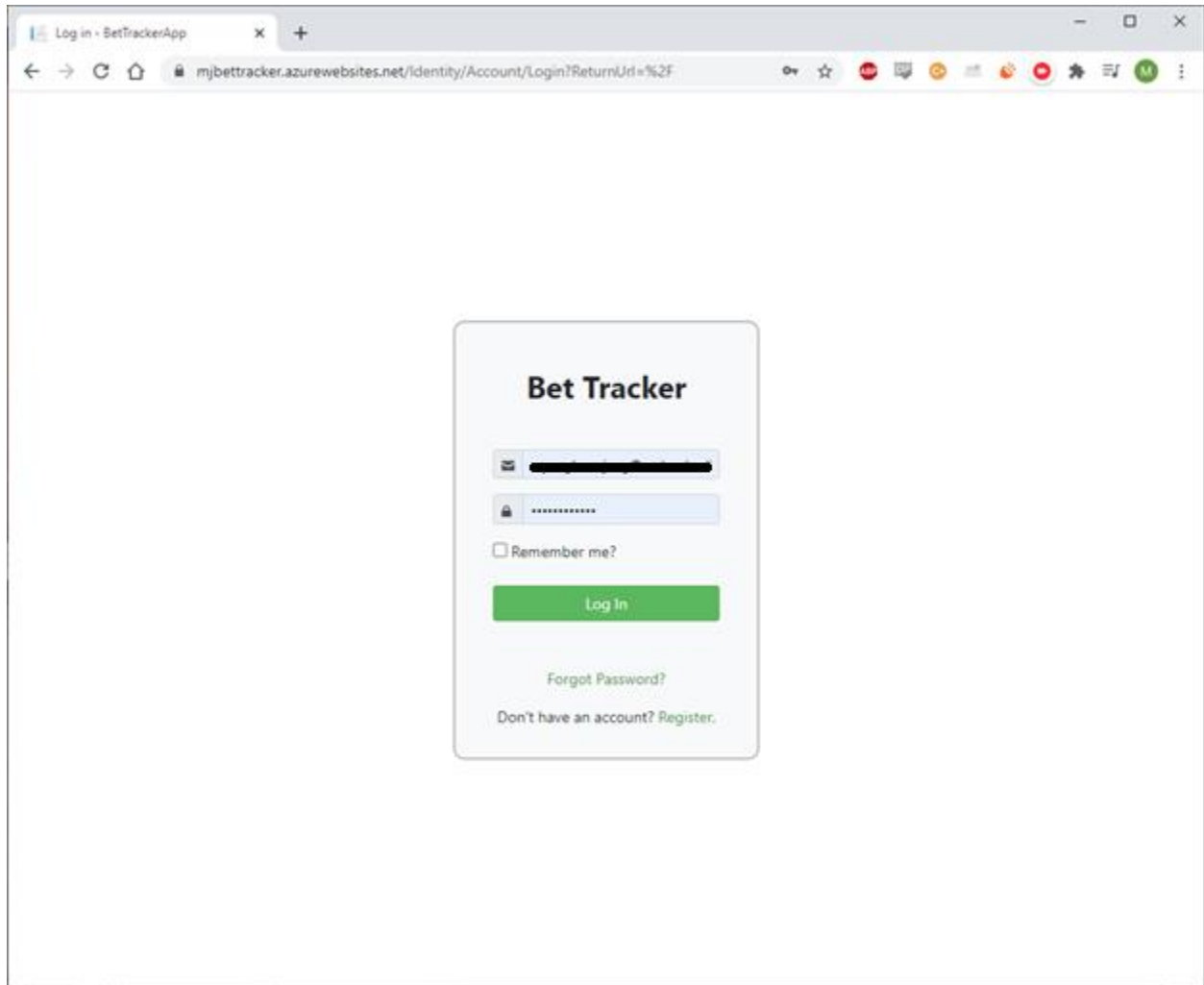


Figure 1: Home Page

This is the Home page of the website with login fields, an email and password, for existing users to log in. A user will receive an error message if the login credentials are incorrect.

A user who has forgotten their password can click the “Forgot Password?” link to start the password recovery process. A new user who wishes to create an account can click the “Register” link to start the registration process.

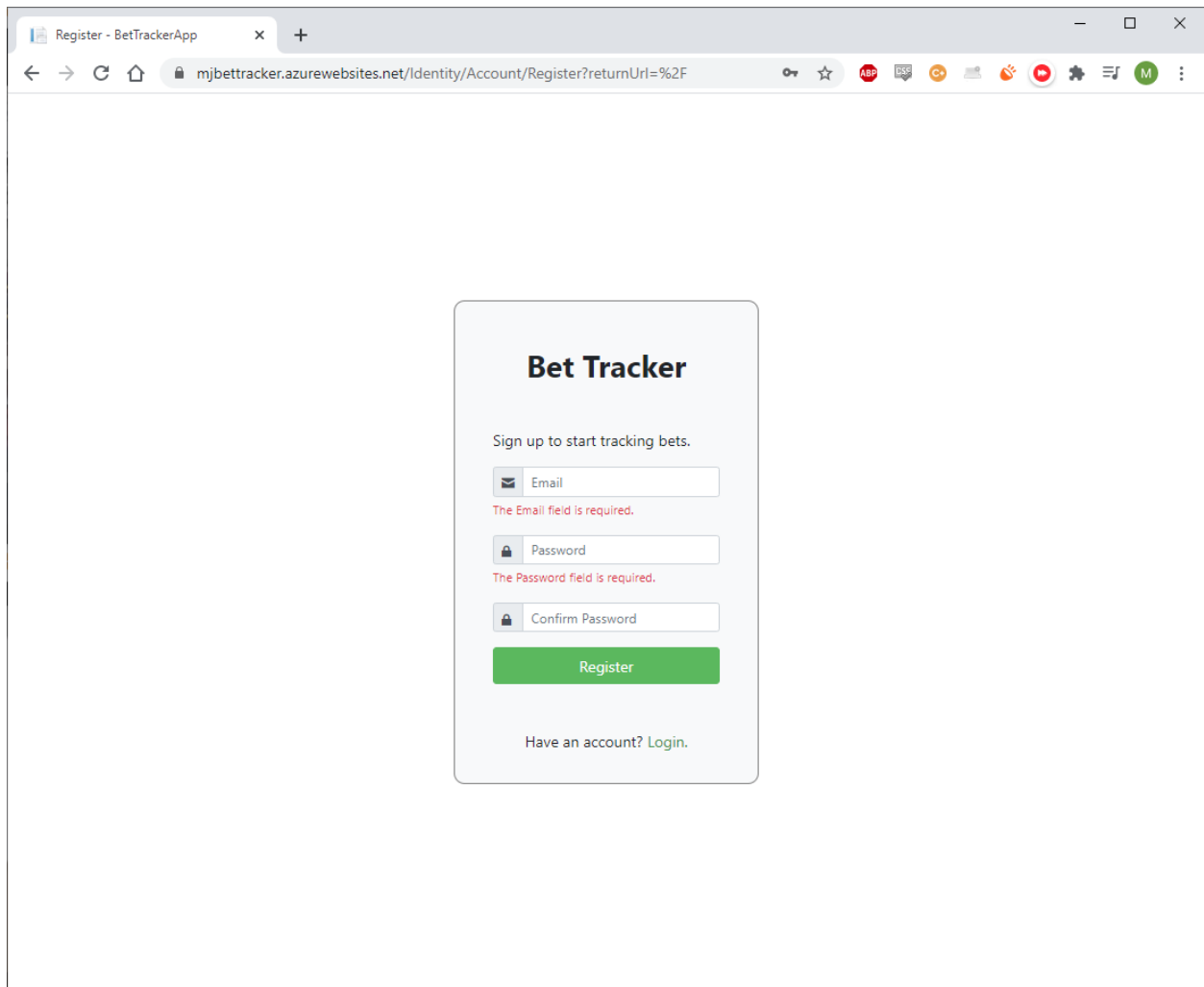


Figure 2: Register

This is the Registration page for new users who wish to create an account. It is a simple registration page with fields for email, password, and password confirmation. The application will validate: the format of the email, the password length is at least 8 characters, and the password fields match.

There is a link to go to the login screen in case the user finds themselves on this page by mistake.

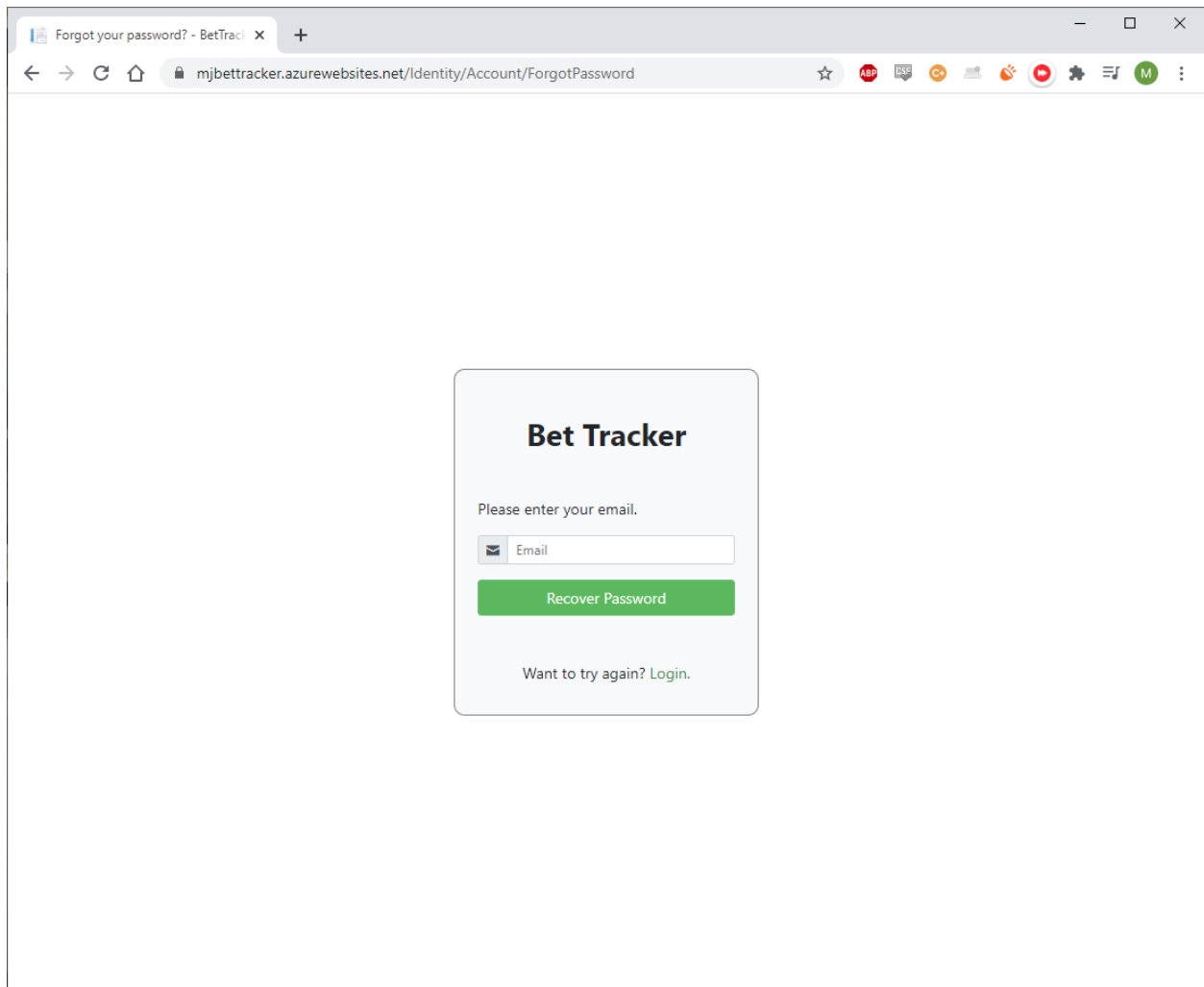


Figure 3: Password Recovery

This is the Password Recovery page that prompts the user for their login email. Upon clicking “Recover Password” the user will receive an email with a temporary password to use to log in. The user will receive an error message instead if the entered email does not exist in the application database.

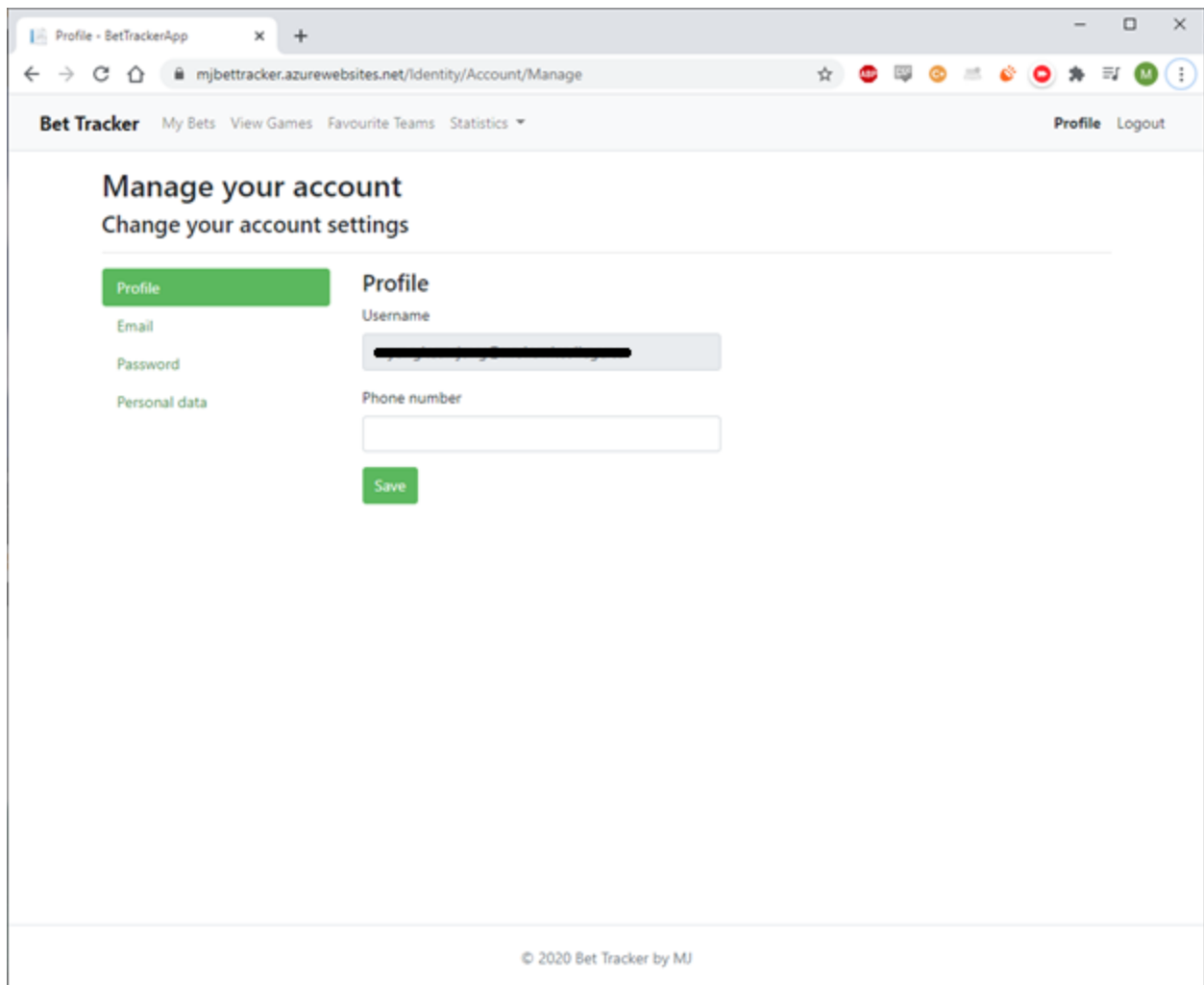


Figure 4: Profile

This is the Profile page for a user to change their login email or their password. This uses the scaffolded Identity System's Views that were modified to fit the style of the app. It has areas for changing email, password, and deleting the account.

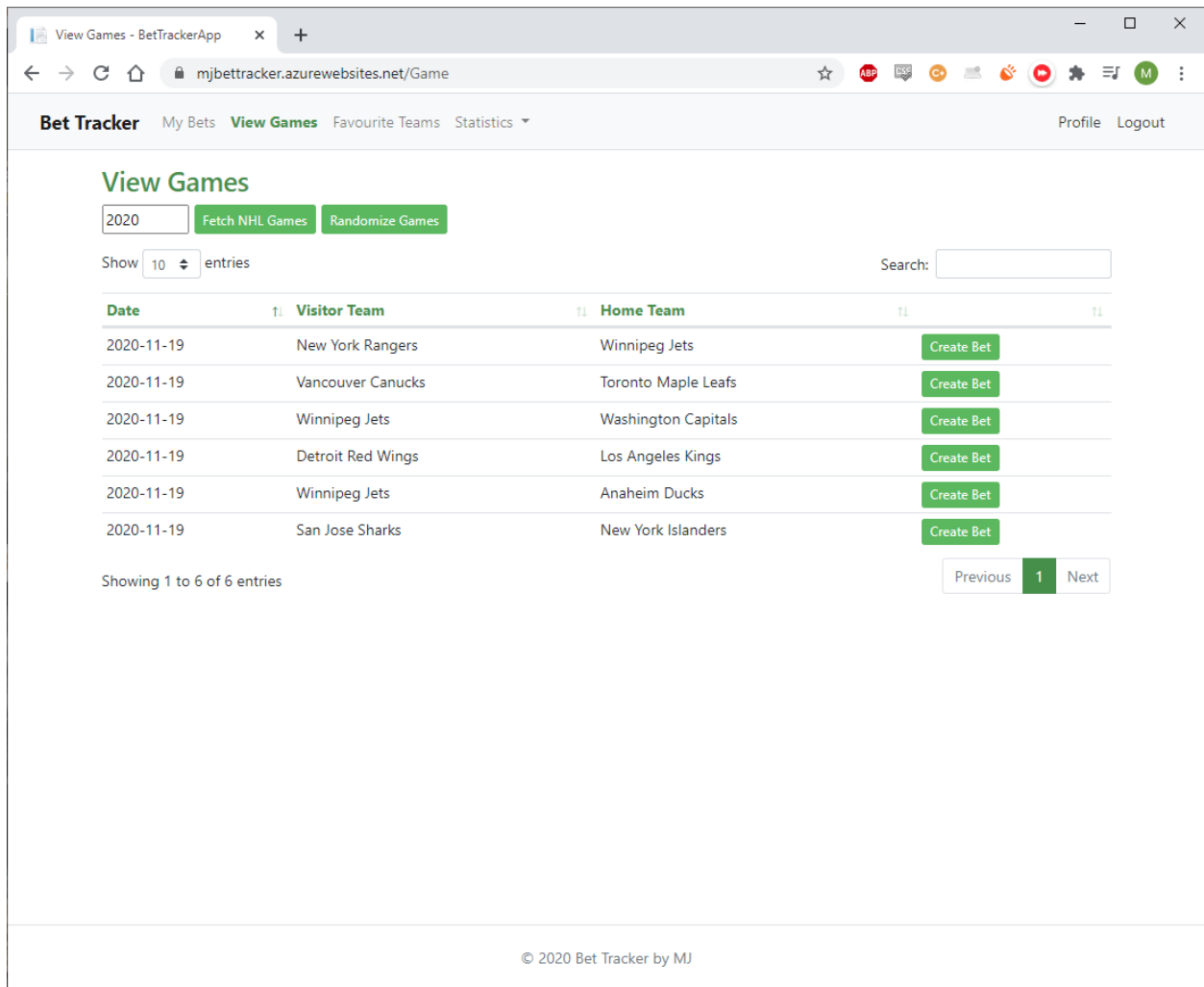


Figure 5: View Games

This is the View Games page for the user to view a list of available games and create a bet record. The table will have options for showing, sorting, searching, and paging the results.

For Admins, there is an additional feature to “Fetch NHL Games. The “Randomize Games” is a test routine for creating fake games.

These features will also update the scores of completed games. These links are not visible to a non-admin (regular) user.



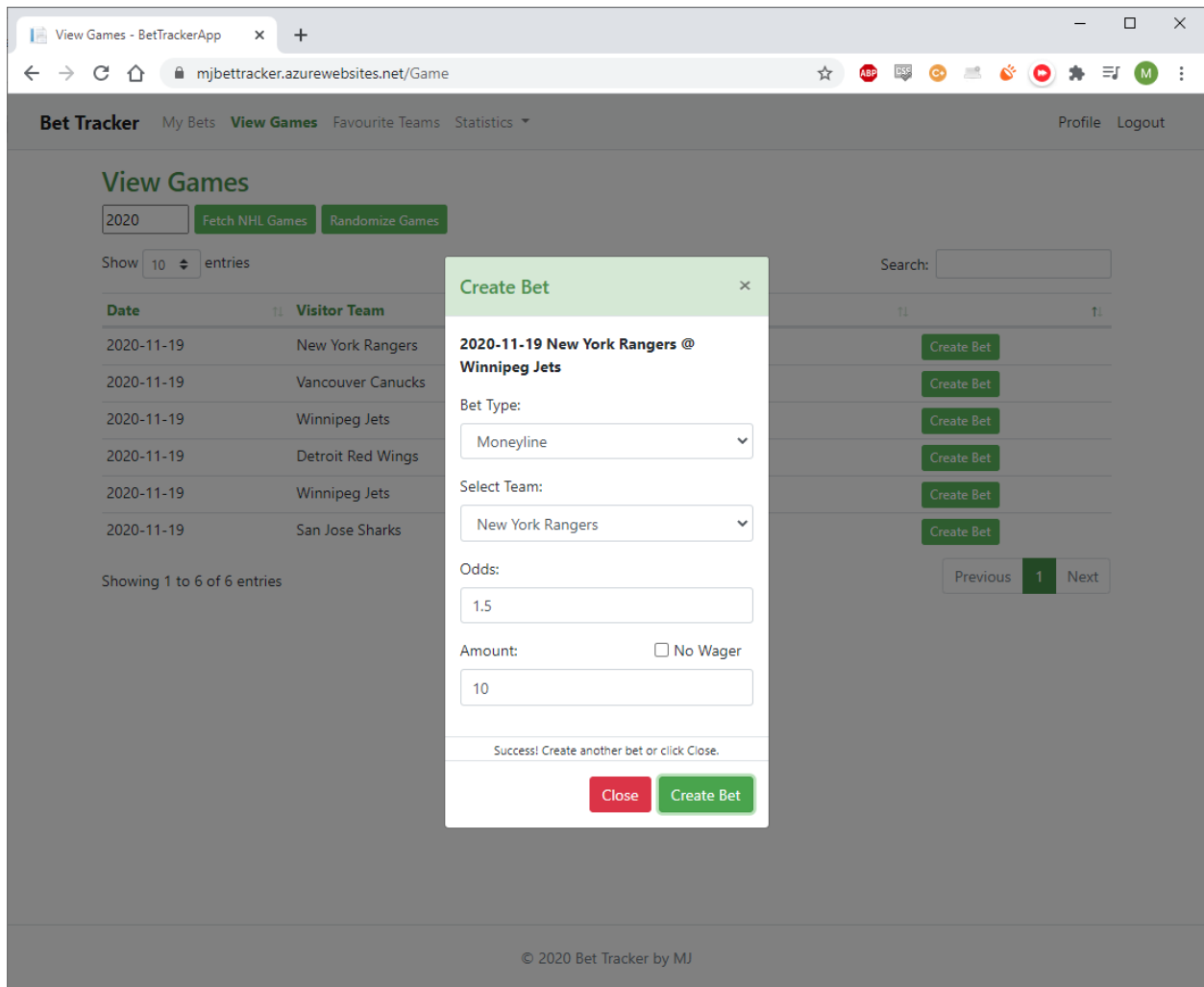


Figure 5.1: Create Bet

Clicking “Create Bet” reveals a modal with details and input fields to record information. The user is able to select which team and the bet type for their bet along with any appropriate value (for spreads and totals), odds, and amount (if wagering money). Upon clicking “Create”, the bet record will appear in the user’s “My Bets” page.

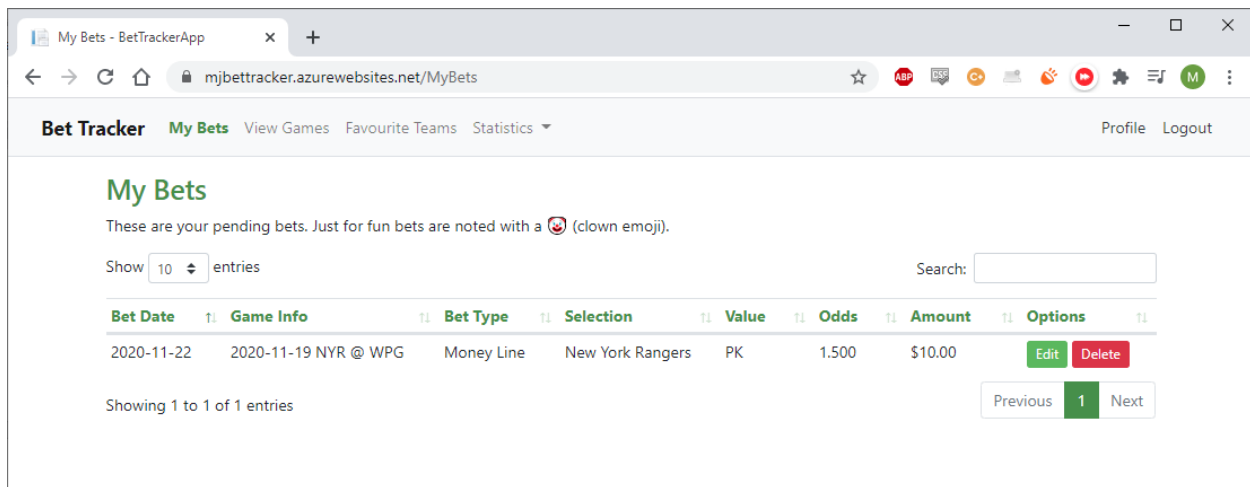


Figure 6: My Bets

This is the My Bets page for the user to view a list of their created. The table will have options for showing, sorting, searching, and paging the results.

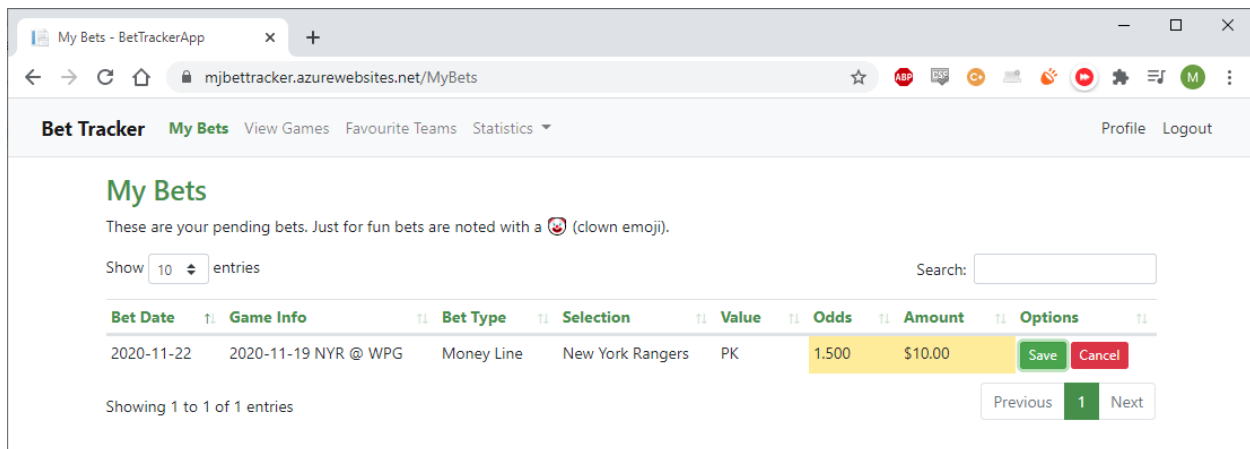


Figure 6.1: My Bets Edit

The user can also update their bet record or delete it. Edits will occur inline in the table. Deleting will prompt the user to confirm before the record is deleted.

Note that this page will only show pending bets. To see historical bets the user will use a report under Statistics.

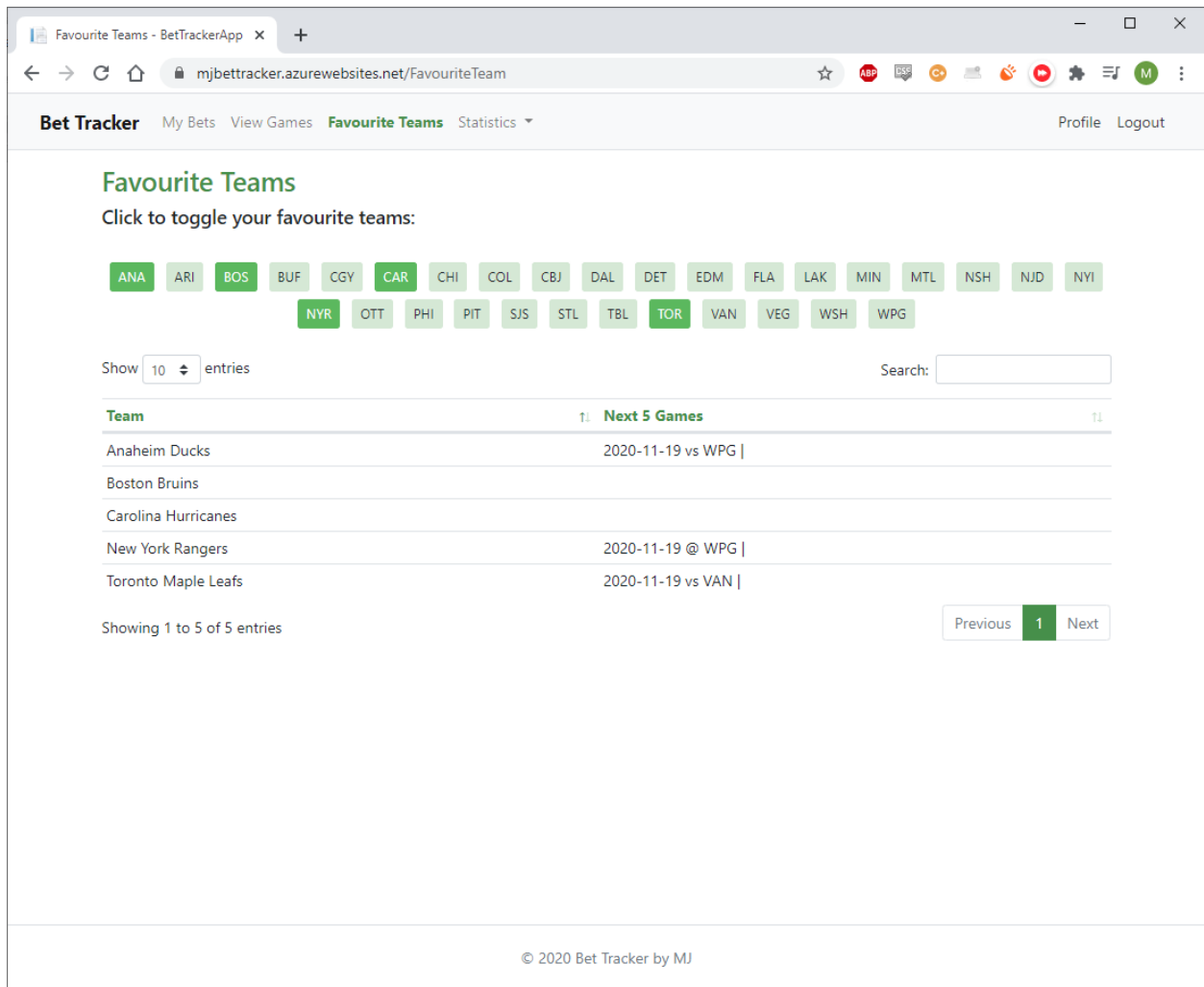


Figure 7: Favourite Teams

This is the Favourite Teams page for a user to keep track and view the schedule of their favourite teams. All teams will be listed in the first section where a user can click to toggle a team as favourite. This will make schedule will appear or disappear in the table below. All favourite teams will be listed with their next 5 scheduled games.

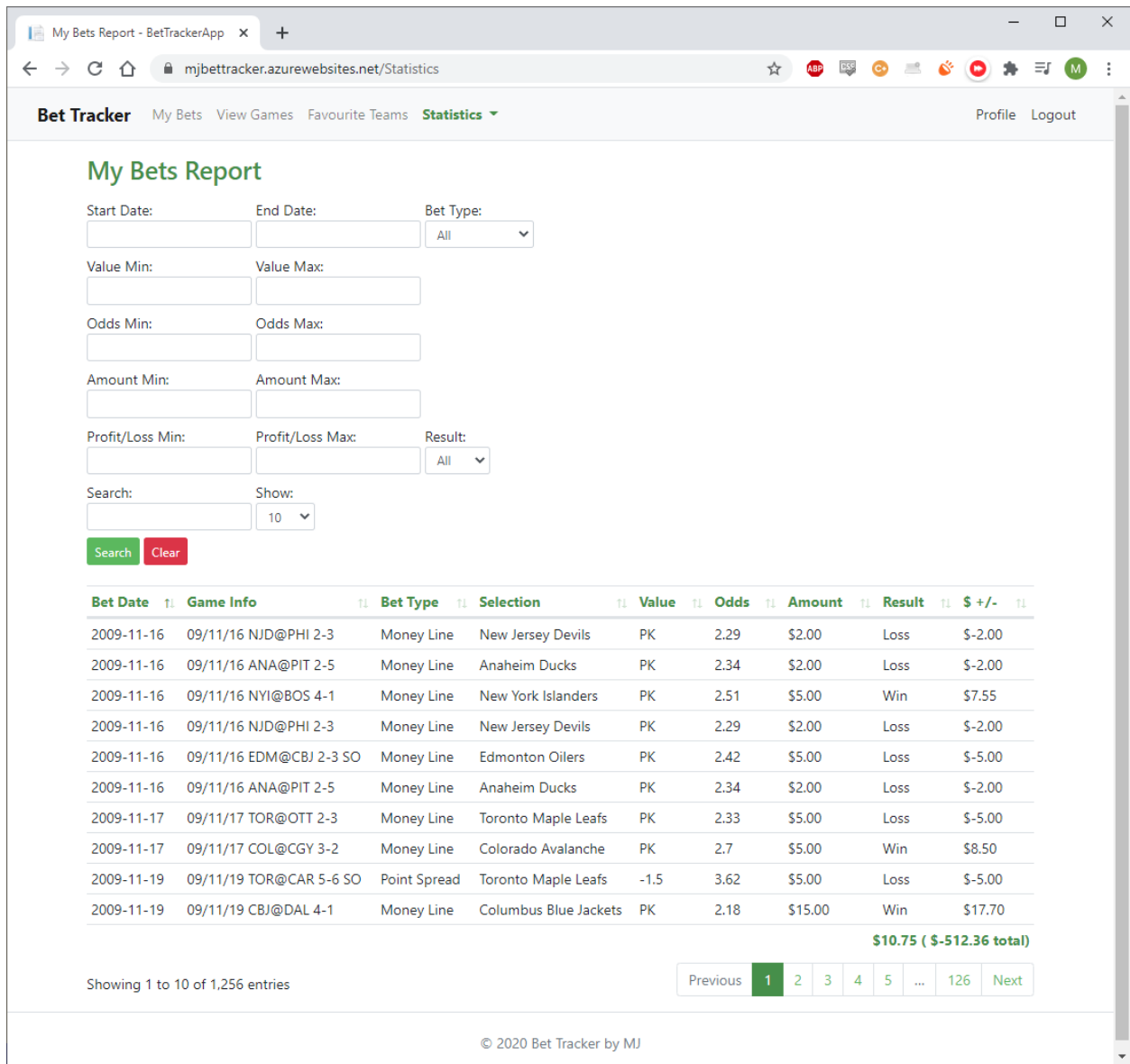


Figure 8: Statistics – My Bets Report

This is the My Bets Report page for a user to view a list of their settled bets based on a date range. The table has options for showing, sorting, searching with ranges, and paging the results. The table has a total row to show the overall Profit/Loss for the date range. Note that this page only shows settled bets. To see pending bets the user will use the My Bets page.

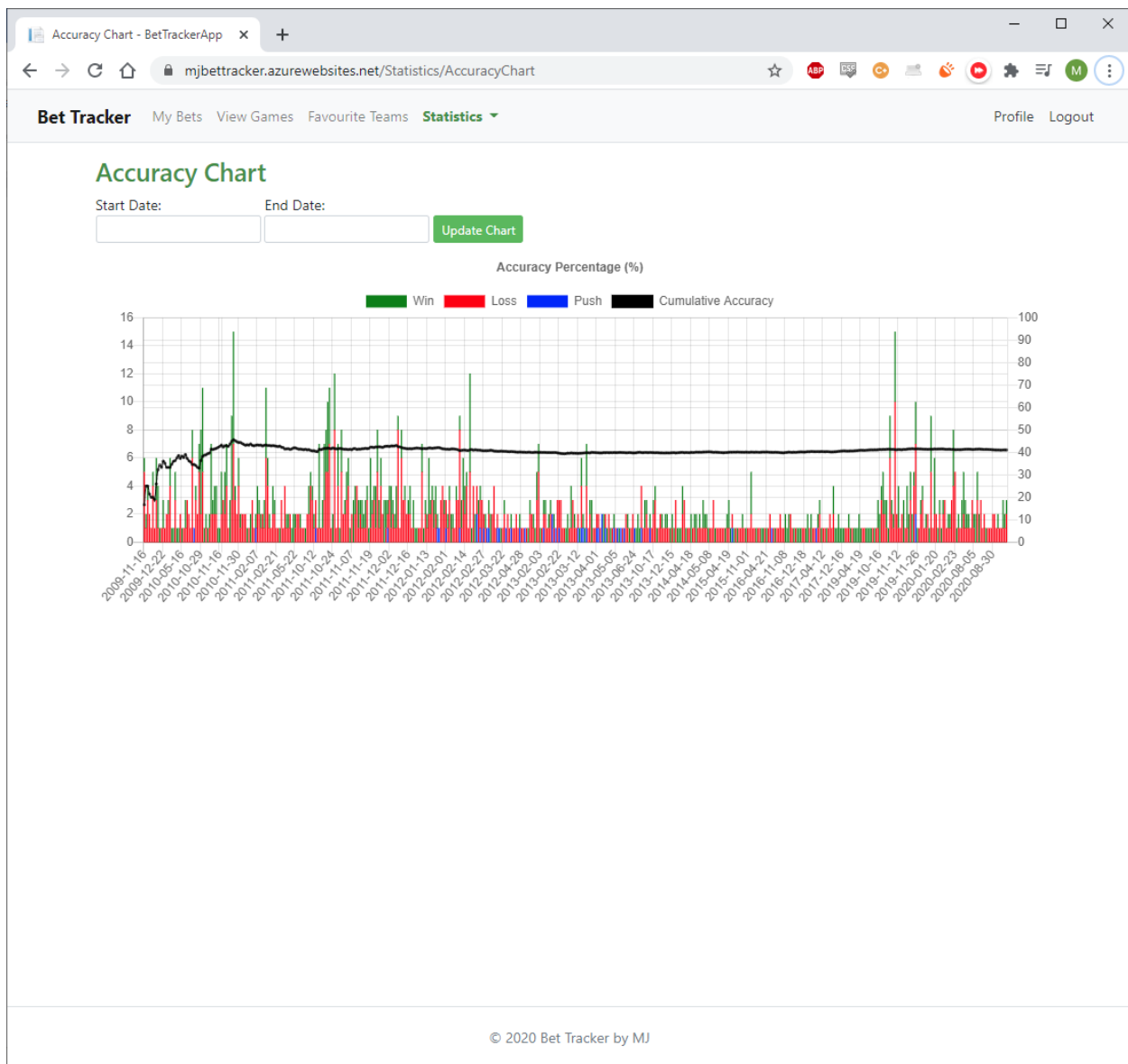


Figure 9: Statistics – Accuracy Chart

This is the Accuracy Chart page for a user to view their guessing accuracy for settled bets for a date range.

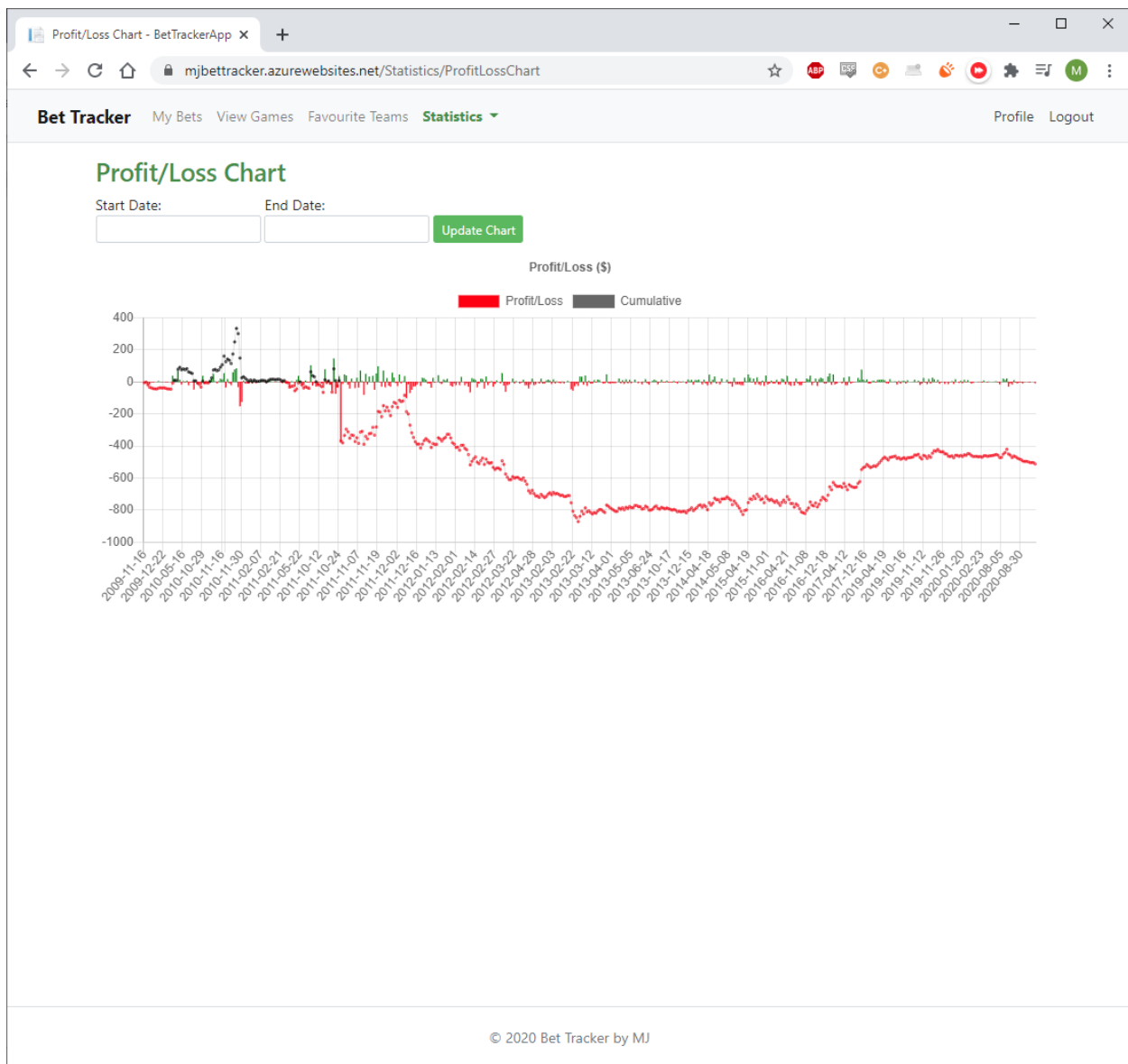


Figure 10: Statistics – Profit/Loss Chart

This is the Profit/Loss Chart page for a user to view their profit/loss for settled bets for a date range.

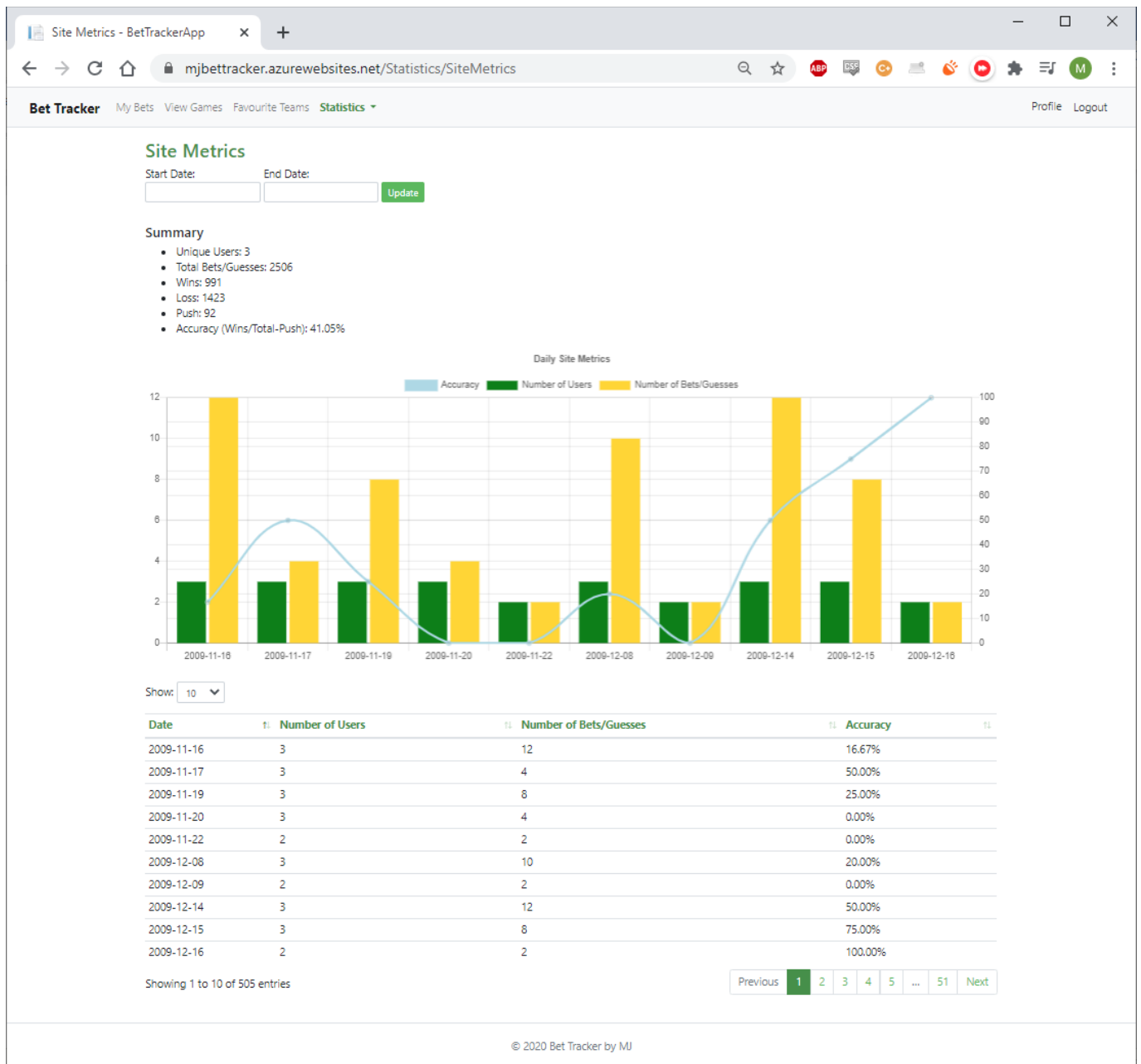


Figure 11: Statistics – Site Metrics

This is the Site Metrics page for an admin user to view site metrics and a chart for a date range to display the number of users, number of bets/guesses made, and the accuracy of bets/guesses made. There will be a summary table for the selected date range and another table to show the statistics for individual dates. The table has options for showing, sorting, and paging the results.

## Development Stack, Framework, Plug-ins

This is a web application developed in Visual Studio 2019 using the Microsoft stack – Windows, Internet Information Services (IIS), SQL Server database, C#/.NET, HTML/JavaScript frontend. The app is deployed in the cloud as an Azure app service with a SQL database.

The frameworks used include ASP.NET Core, Identity, and Entity Framework using the model-view-controller (MVC) architecture. To develop the frontend UI, HTML5 and JavaScript was used including C# (Razor) for the Views. Other tools used for the frontend include Bootstrap, jQuery, Datatables, and Chart.js.

## Extensions

- More sports/leagues to track
- More filter options (e.g. select visiting and home teams)
- Export options for statistics

## Testing Report

Unit tests were created using the Katalon Recorder Chrome browser extension to test the various features of the application using the following plan (as originally proposed):

### Account Management

1. Create a user:
  - a. Fail validation
    - ✓ Email incorrect format should show UI error
    - ✓ Password insufficient length should show UI error
    - ✓ Passwords do not match should show UI error
  - b. Pass validation
    - ✓ Correct email format, password length 8+ chars, fields match
2. Log in as a user
  1. Fail password
  2. Success password
2. Verify Admin only features cannot be seen
3. Log out as a user
  1. Success
4. Change email
  - ✓ UI Confirmation
  - ✓ Actual confirmation (manually check inbox and confirm email change)
    - ✓ There was a bug where the code was getting encoded strangely...
5. Change password
  1. UI Confirmation, change password back (thus confirming it works)
6. Password recovery
  1. UI Confirmation
  2. Actual confirmation (manually check inbox and change password)
    1. Need to update ResetPassword page
    2. Need to update ResetPasswordConfirmation page



7. Delete Account (try logging back in to verify deletion)

Admin Features (note: an admin user will be created as part of development)

1. Automatically fetch NHL game data
- ~~2. Manually edit game data~~
3. Display site metrics

User Features (note: multiple test users will be created)

1. View Games, test the View Games table features:
  - a. Showing
  - b. Sorting
  - c. Searching
  - d. Paging
2. Create bet record
3. My Bets, Test the View My Bets table features (like #1 and add):
  - a. Ranged Searching:
    - i. Date
    - ii. Odds
    - iii. Amount
  - b. Modify bet record
  - c. Delete bet record
4. Favourite Teams:
  - a. Toggle favourite team yes (verify scheduled games appear in table)
  - b. Toggle favourite team no (verify scheduled games disappear in table)
5. Statistics:
  - a. My Bets Report, Test the View My Bets table features (like #3 and add):
    - i. Verify Total column accuracy
  - b. Guess Accuracy Chart, test Guess Accuracy Chart date range search
  - c. Profit/Loss Chart, test Profit/Loss Chart date range search

Please see the following pages for screenshots of testing.

The following is a screenshot of the account management tests:

Log in - BetTrackerApp

localhost:44397/identity/Account/Login?ReturnUrl=%2F

Bet Tracker

Invalid login attempt.

Password

Remember me?

Log In

Forgot Password?

Don't have an account? Register.

Katalon Recorder 5.3.18

NewRecordPlayP. SuiteP. AllPauseReportExport

Test Suites

1 Account Management

- Create a user fail validation
- Create a user success validation
- Logout
- Login fail
- Login success
- Check Admin Feature
- Change password
- Change email
- Password recovery
- Delete user

2 Admin Features

- Fetch Games
- Site Metrics

3 User Features

- Login Test User
- View Games

Passed: 10Failed: 0

Command	Target	Value
open	https://localhost:44397/identity/Account/Login	
type	id=Input_Email	
type	id=Input_Password	Correctpassword
clickAndWait	//button[@type='submit']	
click	link=Profile	
click	id=personal-data	
click	id=delete	
click	id=Input_Password	
type	id=Input_Password	Correctpassword
clickAndWait	xpath=([//button[@type='submit']])[2]	
verifyText	//h2	Bet Tracker
type	id=Input_Email	
type	id=Input_Password	Correctpassword

Command

Target

Value

LogScreenshotsVariablesData DrivenExtension ScriptsReference

Dashboard

[Info] Executing: | click | id=delete | |

[Info] Executing: | click | id=Input\_Password | |

[Info] Executing: | type | id=Input\_Password | Correctpassword |

[Info] Executing: | clickAndWait | xpath=([//button[@type='submit']])[2] | |

[Info] Executing: | verifyText | //h2 | Bet Tracker |

[Info] Executing: | type | id=Input\_Email | |

[Info] Executing: | type | id=Input\_Password | Correctpassword |

[Info] Executing: | clickAndWait | //button[@type='submit'] | |

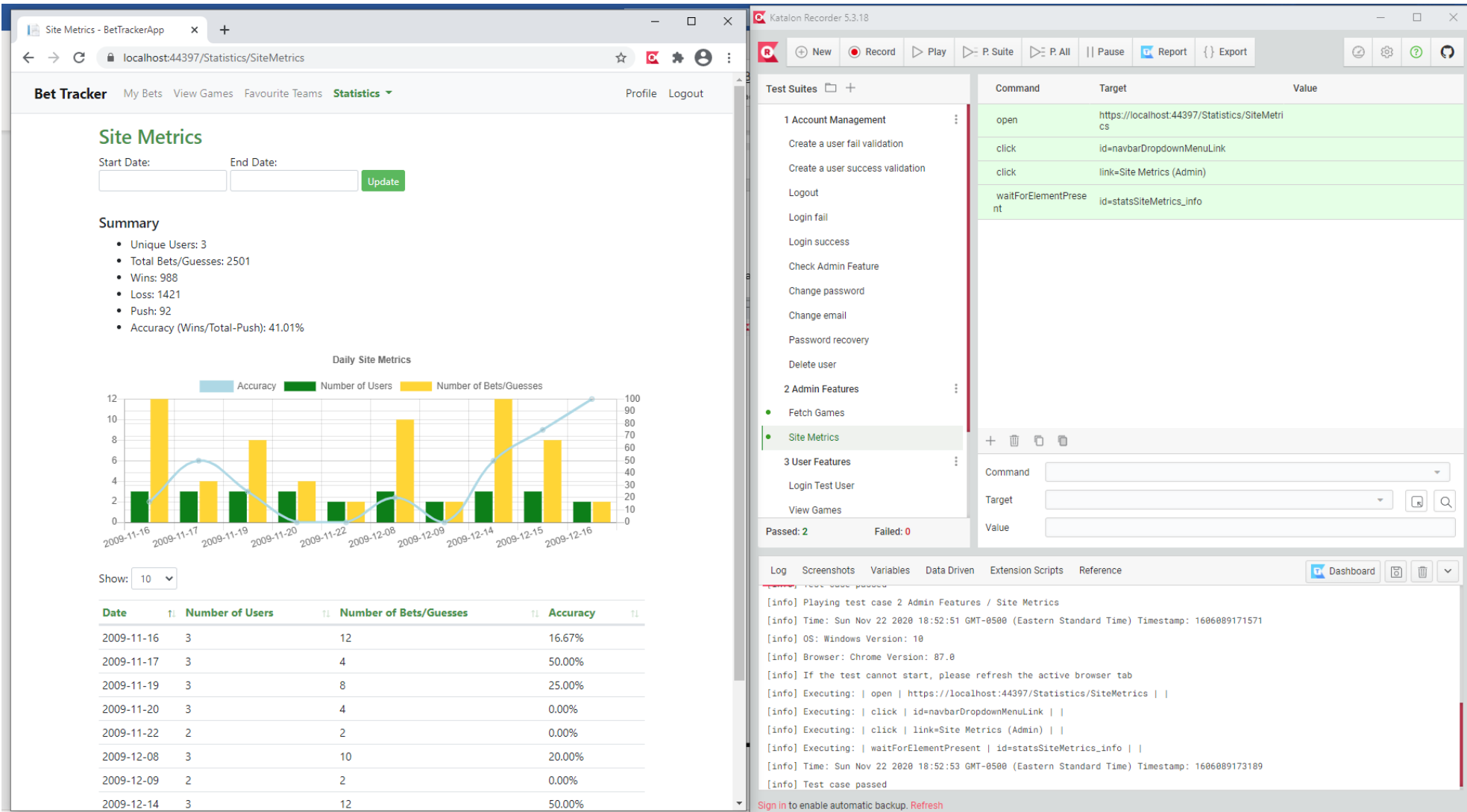
[Info] Executing: | verifyText | //form[@id='account']/div/u1/11 | Invalid login attempt. |

[Info] Time: Sun Nov 22 2020 18:50:38 GMT-0500 (Eastern Standard Time) Timestamp: 1606089038180

[Info] Test case passed

Sign in to enable automatic backup. Refresh

The following is a screenshot of the admin features tests:



The following is a screenshot of a user test:

View Games - BetTrackerApp

localhost:44397/Game

Bet Tracker

My Bets

View Games

Favourite Teams

Statistics

Profile

Logout

View Games

Show 10 entries

Search:

Date	Visitor Team	Home Team	
2020-11-09	Toronto Maple Leafs	New Jersey Devils	Create Bet
2020-11-09	Washington Capitals	Philadelphia Flyers	Create Bet
2020-11-09	Dallas Stars	San Jose Sharks	Create Bet
2020-11-09	Washington Capitals	Philadelphia Flyers	Create Bet
2020-11-09	Boston Bruins	Florida Panthers	Create Bet
2020-11-09	New Jersey Devils	Carolina Hurricanes	Create Bet
2020-11-09	Dallas Stars	San Jose Sharks	Create Bet
2020-11-09	New York Islanders	Florida Panthers	Create Bet
2020-11-09	Tampa Bay Lightning	Florida Panthers	Create Bet
2020-11-09	Washington Capitals	Philadelphia Flyers	Create Bet

Showing 1 to 10 of 15 entries

Previous12Next

Create Bet

2020-11-09 Toronto Maple Leafs @ New Jersey Devils

Bet Type: Moneyline

Select Team: Toronto Maple Leafs

Odds:

Amount: ☐ No Wager

Success! Create another bet or click Close.

CloseCreate Bet

Katalon Recorder 5.3.18

NewRecordPlayP. SuiteP. AllPauseReportExport

Test Suites

CommandTargetValue

Login fail	open	https://localhost:44397/Game
Login success	click	link=Create Bet
Check Admin Feature	click	id=betSelect
Change password	select	id=betSelectlabel=Moneyline
Change email	click	id=betSelect
Password recovery	click	id=teamSelect
Delete user	select	id=teamSelectlabel=Toronto Maple Leafs
2 Admin Features	click	id=teamSelect
Fetch Games	click	id=isBetForFunCheckbox
Site Metrics	click	id=createBetButton
3 User Features	pause	2000
Login Test User	verifyText	//div[@id='createBetErrorDiv']/spanSuccess! Create another bet or click Close.
View Games		
Create Bet		
My Bets		
Favourites		
Statistics		

Passed: 1Failed: 0

LogScreenshotsVariablesData DrivenExtension ScriptsReference

Dashboard

[info] Executing: | click | id=betSelect | |

[info] Executing: | click | id=teamSelect | |

[info] Executing: | select | id=teamSelect | label=Toronto Maple Leafs |

[info] Executing: | click | id=teamSelect | |

[info] Executing: | click | id=isBetForFunCheckbox | |

[info] Executing: | click | id=createBetButton | |

[info] Executing: | pause | 2000 | |

[info] Expand variable '2000' into '2000'

[info] Executing: | verifyText | //div[@id='createBetErrorDiv']/span | Success! Create another bet or click Close. |

[info] Time: Sun Nov 22 2020 18:54:37 GMT-0500 (Eastern Standard Time) Timestamp: 1606089277637

[info] Test case passed

Sign in to enable automatic backup.Refresh

The following is a screenshot of the completed user tests:

