

# Project Arcade – Final Report

## Summary:

The primary motivation for our project was driven by New York Times Games. These are logical puzzles that are hidden behind a paywall. Most of them, consequently, require an account to access. To address these issues, we created Arcade – a web application that hosts a collection of similar puzzles, which can be played for free and without requiring account creation.

Stakeholders include the client, Professor Ritchey, players and the developer team. We implemented four games – Wordle, Spelling Bee, Letter Boxed and 2048. We believe they offer a substantial amount of variety and are unique in their own way. Each game comes with its own scoring logic and for users who have accounts, we keep track of their scores across games. Finally, we also allow users to sign in with Google, GitHub or Spotify to ensure accessibility. We have attempted to design the application in a way that allows future developers to seamlessly add more games and integrate existing features into the games seamlessly.

## User Stories:

Please note this does not include bug fixes which were also assigned story points

### Feature: Create a player account on Arcade

*As a unregistered game enthusiast*

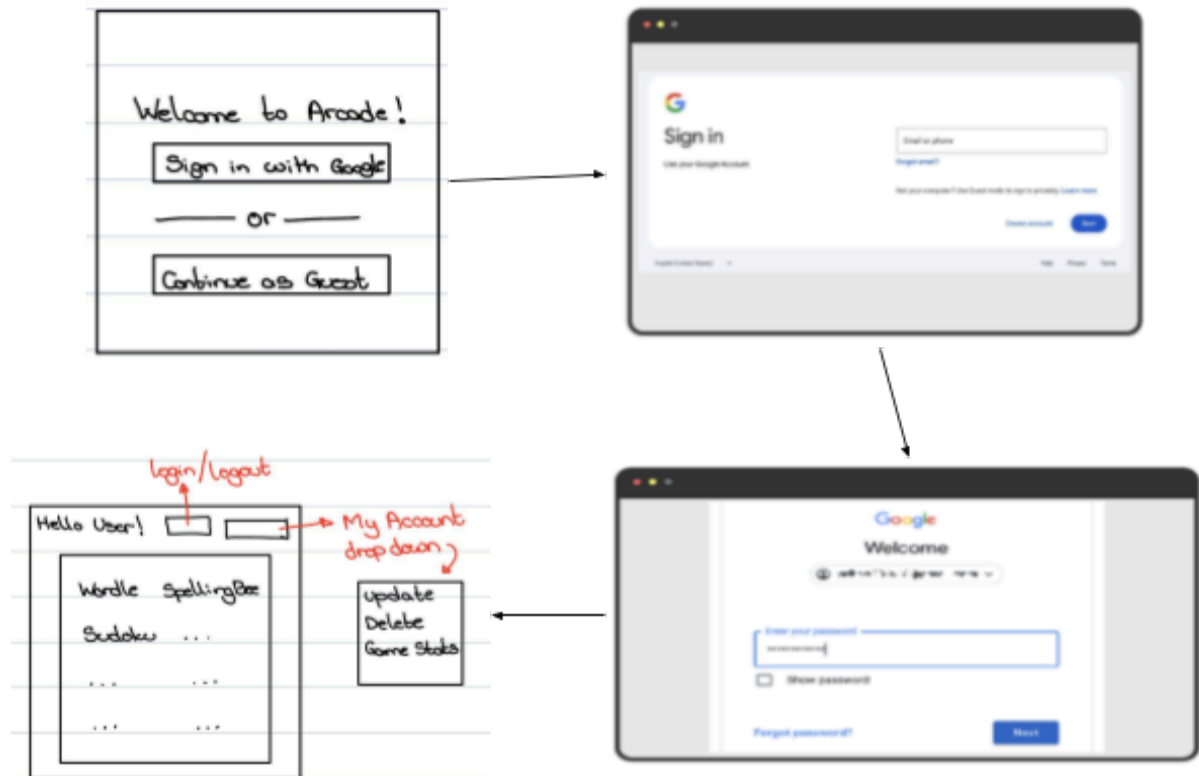
*So that I can play games and save my history*

*I want to create an account with Arcade*

**Story Points: 5**

**Implementation Status:** Complete

**Original UI Mockups:**



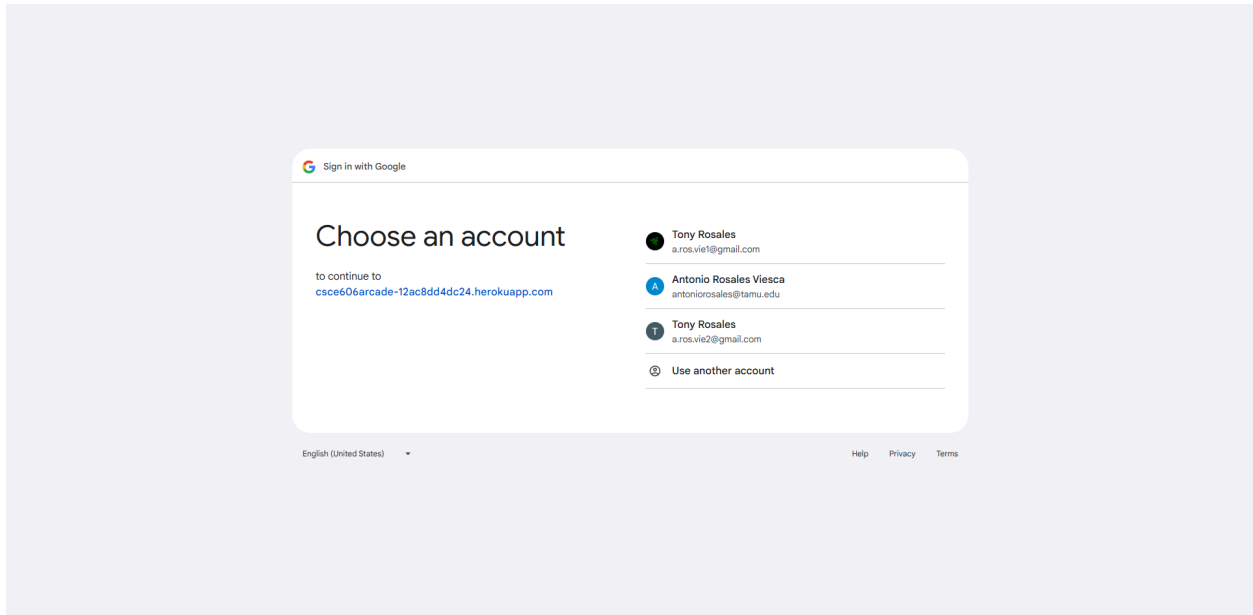
## Final Implementation

### Arcade

Please select one of the options to continue:

Login via SSO

Continue as Guest



## Feature: Login to Arcade

*As a returning Arcade account holder*

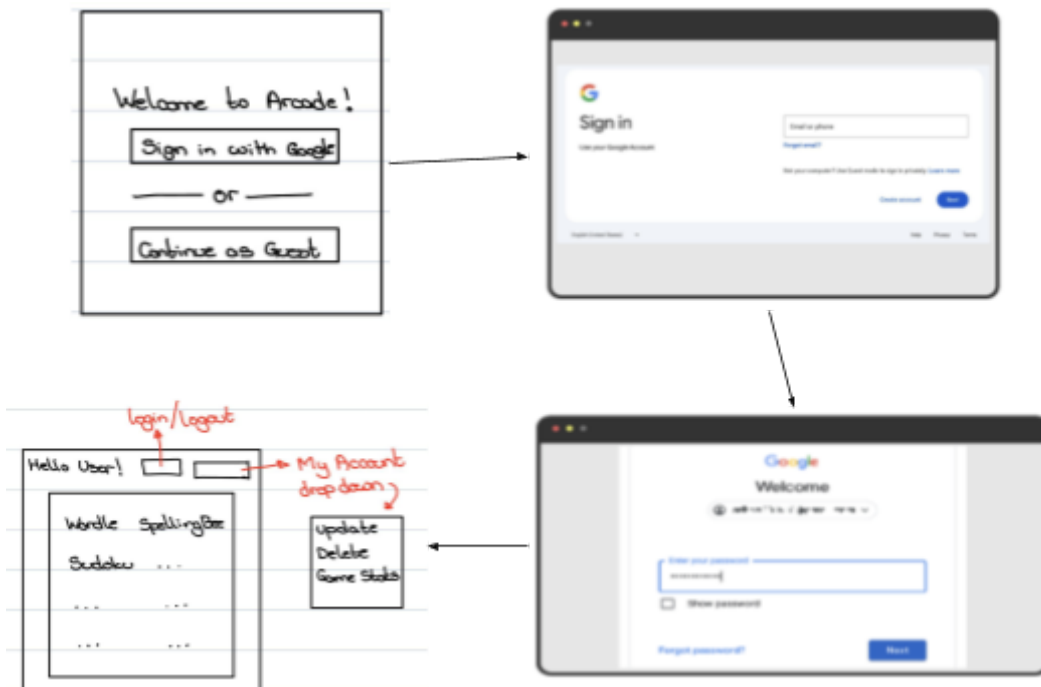
*So that I see my account & role*

*I want to login to Arcade*

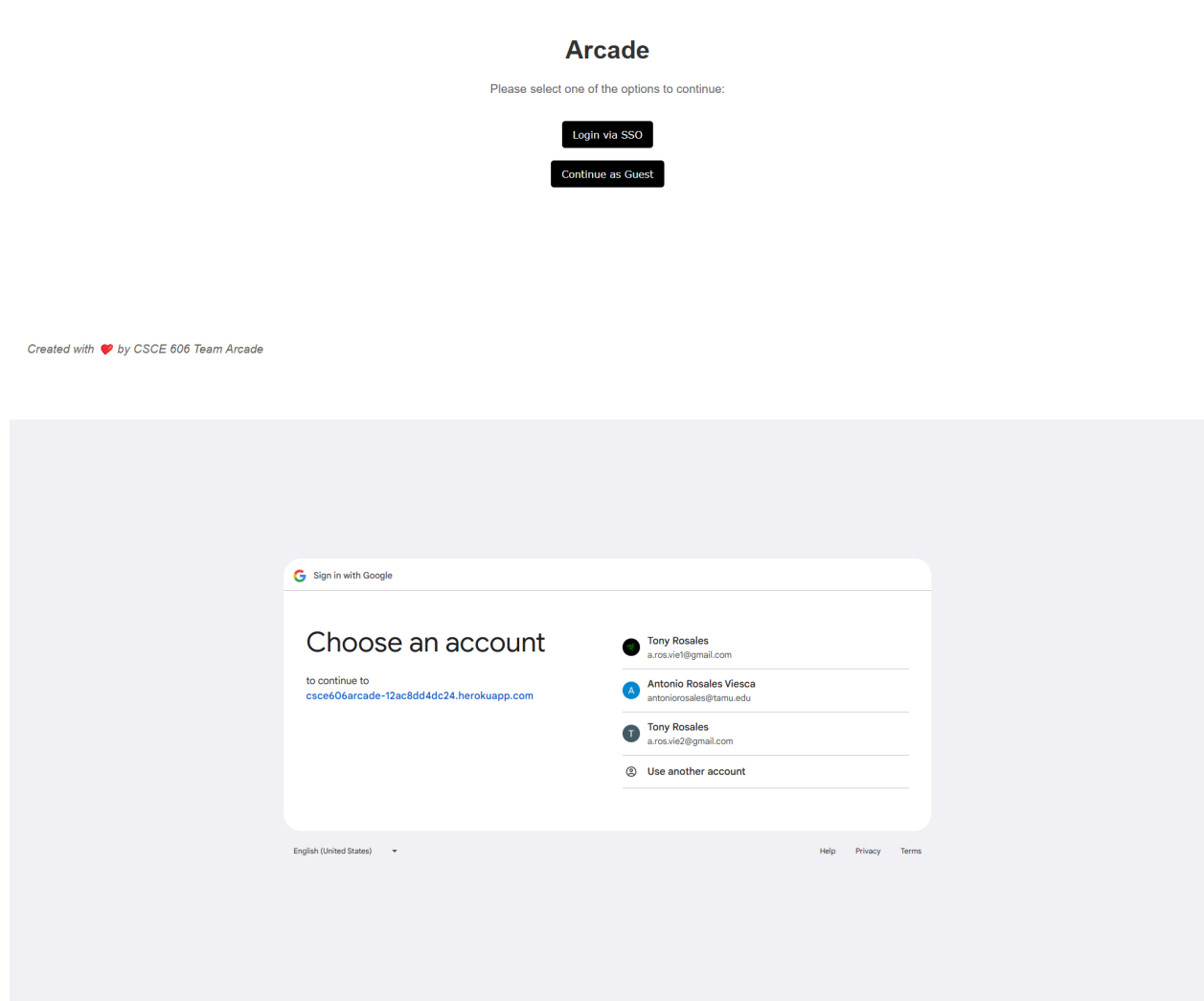
**Story Points: 3**

**Implementation Status: Complete**

**Original UI Mockups:**



## Final Implementation:



## Feature: System Admin role account & access

*As a System Admin user*

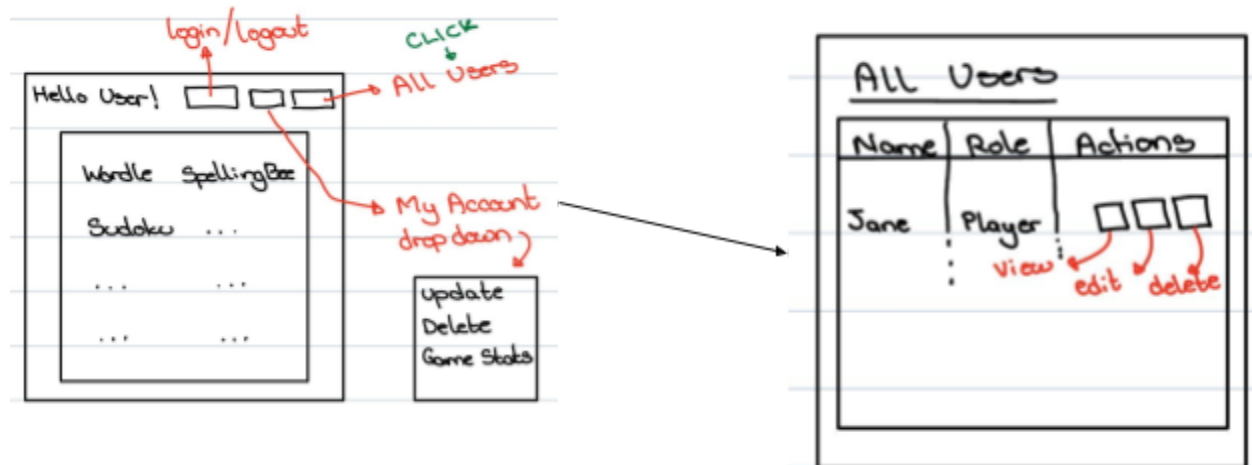
*So that I can see all registered users*

*I want to navigate to the Users page*

**Story Points: 3**

**Implementation Status: Complete**

**Original UI Mockups:**



## Final Implementation:

Howdy Antonio!



Search by first name, last name or role...

10/10/2020

All Users			
First name	Last name	Connected accounts	Roles
Philip	Ritchey	G	System Admin Spelling Bee Wordle Letter Boxed 2048
Antonio	Rosales	G	System Admin Letter Boxed
Junchao	Wu	G	System Admin
Kanishk	Chhabra	G	System Admin
Tejas	Singhal	G	System Admin Spelling Bee Wordle Letter Boxed

## Feature: Display game list

As a player user

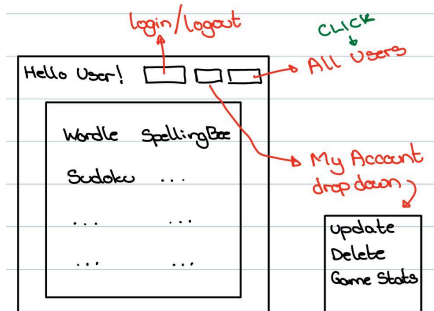
So that I can see all available games

I want to navigate to homepage & see all the games

Story Points: 3

Implementation Status: Complete

Original UI Mockups

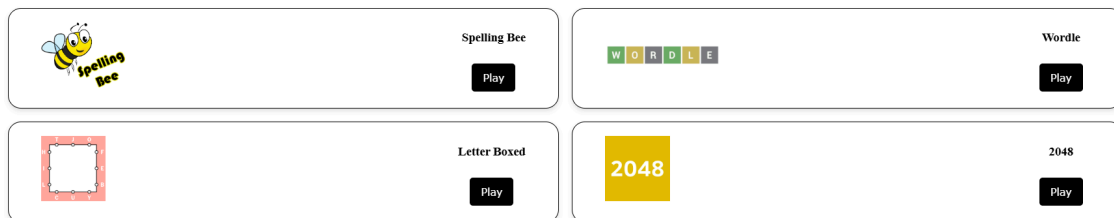


## Final Implementation

Howdy Antonio!



### Games



## Feature: Update user roles as Admin

*As a System Admin User*

*So that I can upgrade & downgrade users*

*I want to change roles assigned to users*

**Story Points: 9**

**Implementation Status:** Complete

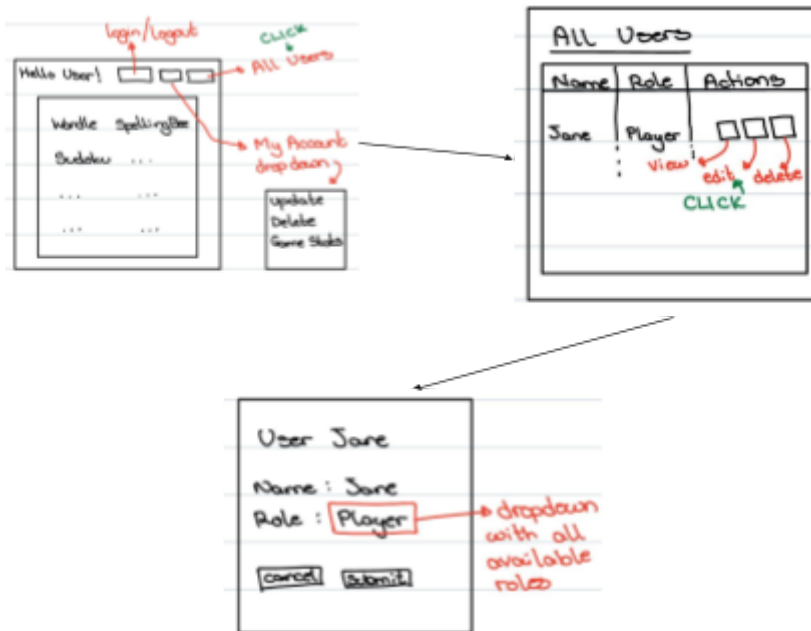
This story was originally assigned 3 story points in Sprint 1. However, the page that was delivered did not allow for the editing of roles.

The ability for system admins to assign and manage user roles was added in Sprint 2 and was assigned 2 story points.

Its aesthetic presentation was then revised once again in Sprint 3 and assigned another 2 story points.

Finally, sorting functionality was added during sprint 4. This task was assigned a final 2 points.

## Sprint 1 Mockups:



## Sprint 2 Mockups:

The diagram shows a hand-drawn mockup for a 'My Account' page. It includes fields for 'First Name', 'Last Name', 'Roles', and 'Identities'. The 'Roles' section has two options: 'Puzzle Setter' and 'Puzzle Aesthetician', each with a checkbox. The 'Identities' section has three options: 'G' (pcr@tamv.edu), 'F' (Phillip Ritchey), and 'X' (@philritch).

**My Account**


First Name:  
Last Name:

**Roles**



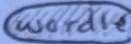
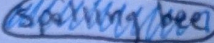
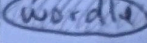

Puzzle Setter ☐  
Puzzle Aesthetician ☐

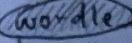
**Identities**

☐ G pcr@tamv.edu  
☐ F Phillip Ritchey  
☐ X @philritch

All Users		
Username	Roles Assigned	Identities
Prof. Ritchey	Puzzle Setter <input type="checkbox"/> Puzzle Aesthetician <input type="checkbox"/> Member <input type="checkbox"/> <input type="button" value="+ Add Role"/>	 pcr@tamv.edu
—	—	—

### Sprint 3 Mockups:

All Users		
Name	Identities	Roles
Alice	G	
Bob	G, 	
Carol	~	
Dave	~	 



- setter

hover



Final Implementation:

Howdy Antonio!

Search by first name, last name or role...

All Users

First name	Last name	Connected accounts	Roles
Philip	Ritchey	G	System Admin Spelling Bee Wordle Letter Boxed 2048
Antonio	Rosales	G	System Admin Letter Boxed
Junchao	Wu	G	System Admin
Kanishk	Chhabra	G	System Admin
Tejas	Singhal	G	System Admin Spelling Bee Wordle Letter Boxed

Manage Roles for 'Philip Ritchey'

General Roles

Role	Options
System Admin	Remove Role
Member	Remove Role

Game Roles

Role	Games	Options
Puzzle Aesthetician	Spelling Bee Wordle Letter Boxed 2048 + Add Game	Remove All
Puzzle Setter	Spelling Bee Wordle Letter Boxed	Remove All

Feature: Player User Game Statistics Dashboard

As a Player User  
So that I can see how well I'm performing  
I want to navigate to my statistics dashboard

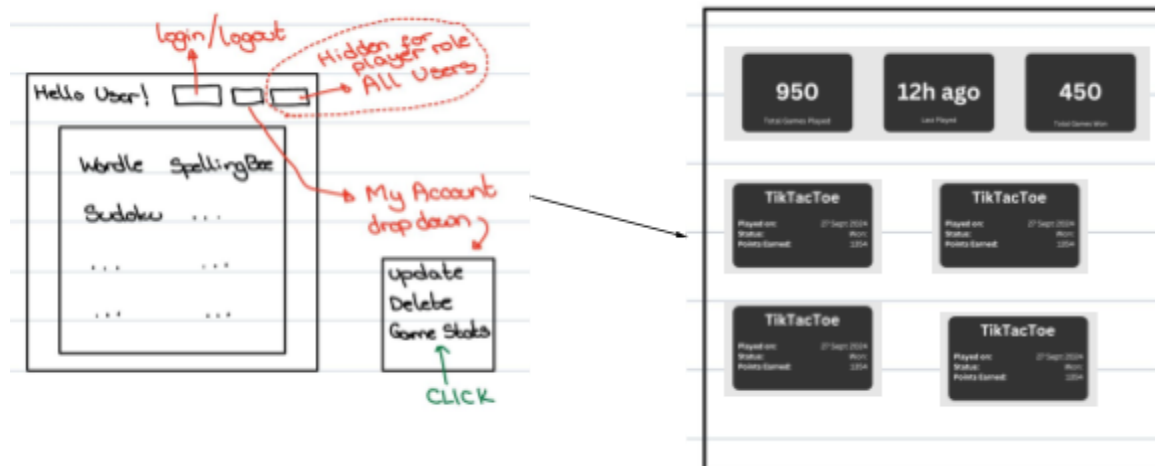
Story Points: 10

Implementation Status: Complete

This feature was originally assigned 4 story points. However, the dashboard page produced by the end of Sprint 1 was non-functional as it had not been integrated with any games and contained stubbed information.

Integration with Wordle and Spelling Bee was completed during Sprint 3 and was assigned 3 story points.  
Another 3 story points were assigned to the integration of this feature with Letter Boxed and 2048 during Sprint 4.

## Original UI Mockups:

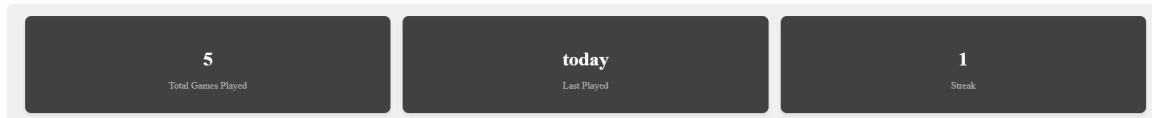


## Final Implementation:

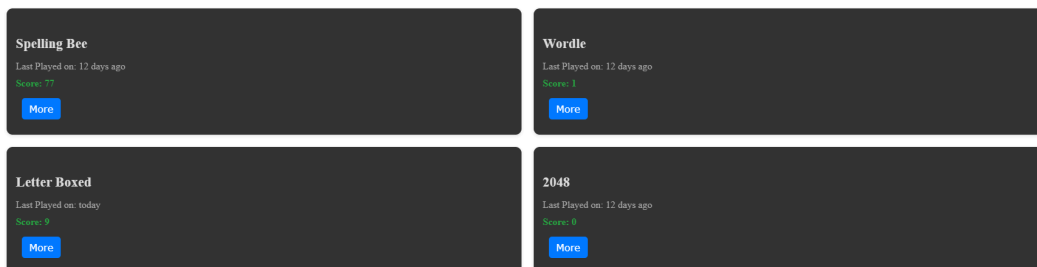
Howdy Antonio!



Welcome to Your Dashboard!



### Your Recent Games



## Feature: User settings are persisted

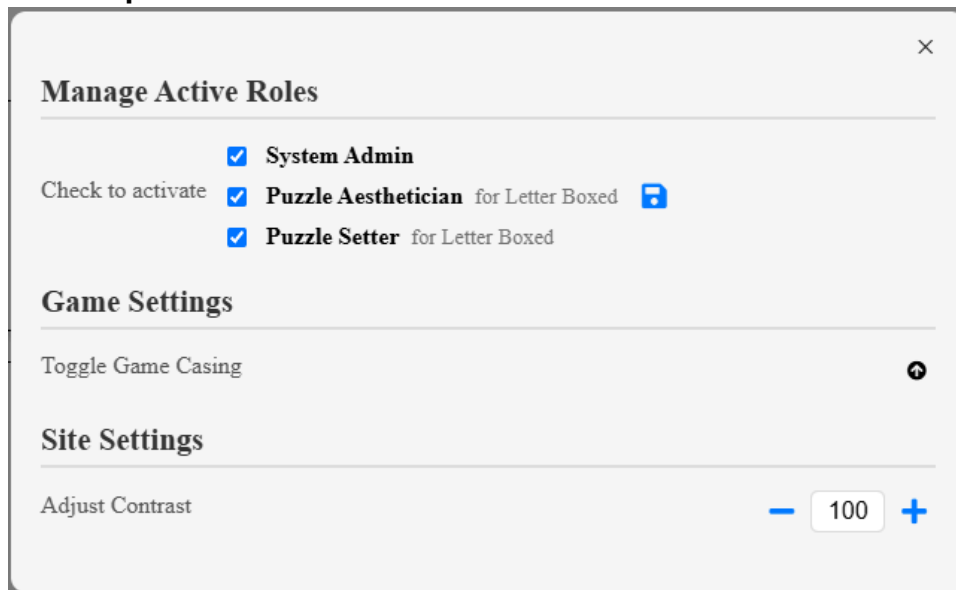
*As a user*

*So that I can pick up where I left off  
I want my settings to be persisted*

**Story Points: 1**

**Implementation Status: Complete**

## Final Implementation:



## Feature: Play Wordle

As a user

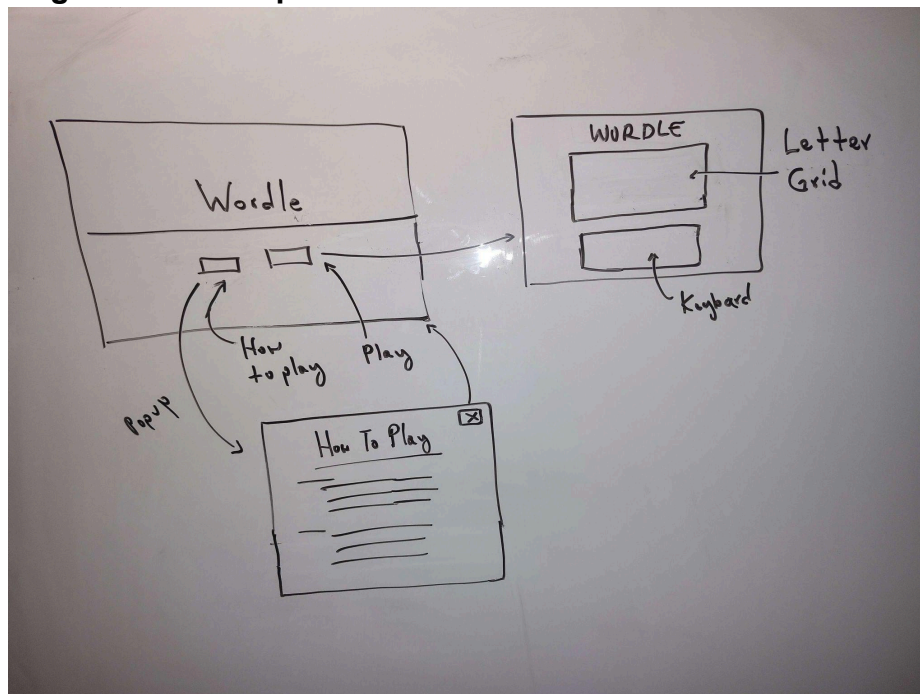
So that I can play Wordle

I want to be able to navigate to the Wordle page and play the current match

Story Points: 3

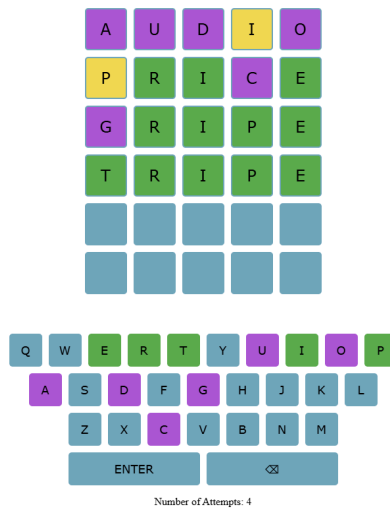
Implementation Status: Complete

Original UI Mockups



## Final Implementation:

Congratulations! You guessed the correct word!



Go Back

## Feature: Wordle UI and Aesthetics

*As a puzzle aesthetician*

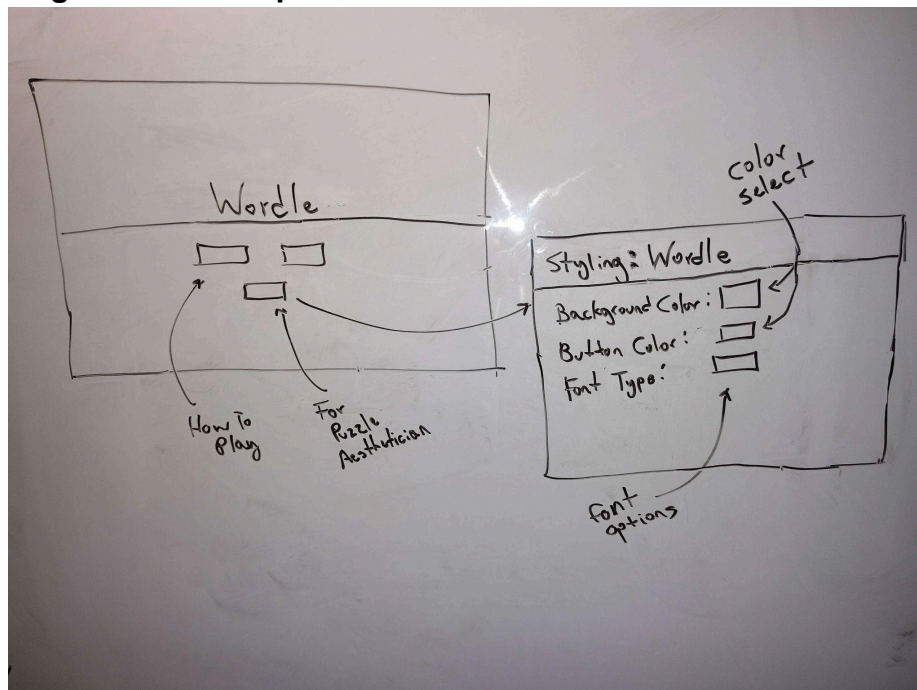
*So that I can customize Wordle*

*I want to navigate to and change the styling of the Wordle page*

**Story Points: 3**

**Implementation Status: Complete**

**Original UI Mockups:**





## Final Implementation:

Howdy Antonio!



### Edit Aesthetic

Correct Letter & Position   
Correct Letter   
Incorrect Letter   
Default   
Font   
Font



### Wordle



## Feature: Play Spelling Bee

*As a user*

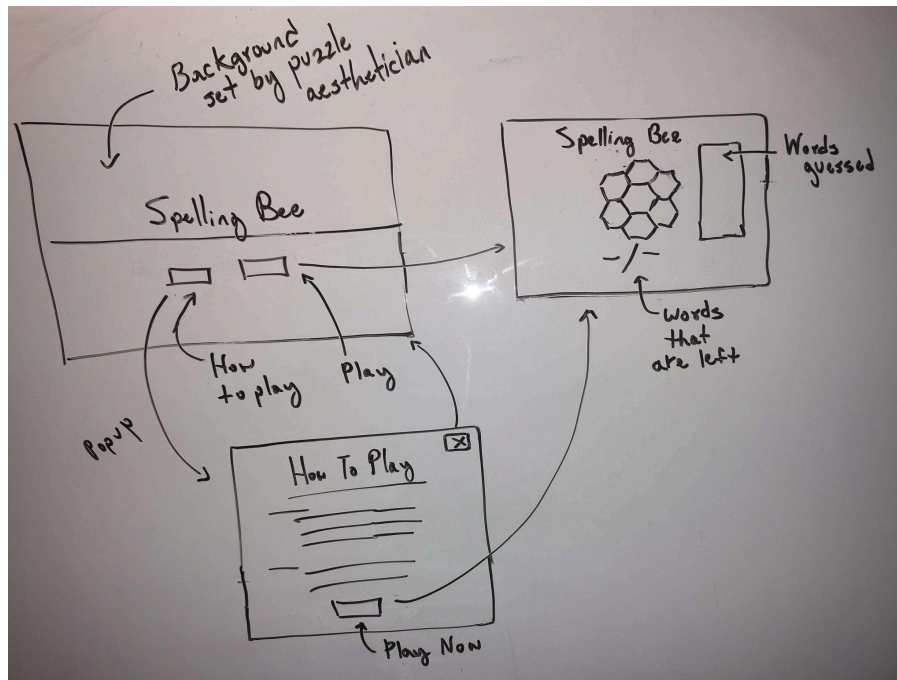
*So that I can play Spelling Bee*

*I want to navigate to the Spelling Bee page and play the current match*

**Story Points: 3**

**Implementation Status:** Complete

**Original UI Mockups:**

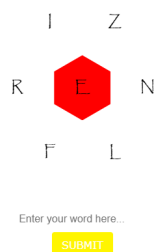


## Final Implementation:

Howdy Antonio!



Spelling Bee



Score: 0  
Rank: Blob

Found words:

## Feature: Spelling Bee UI and Aesthetics

*As a puzzle aesthetician*

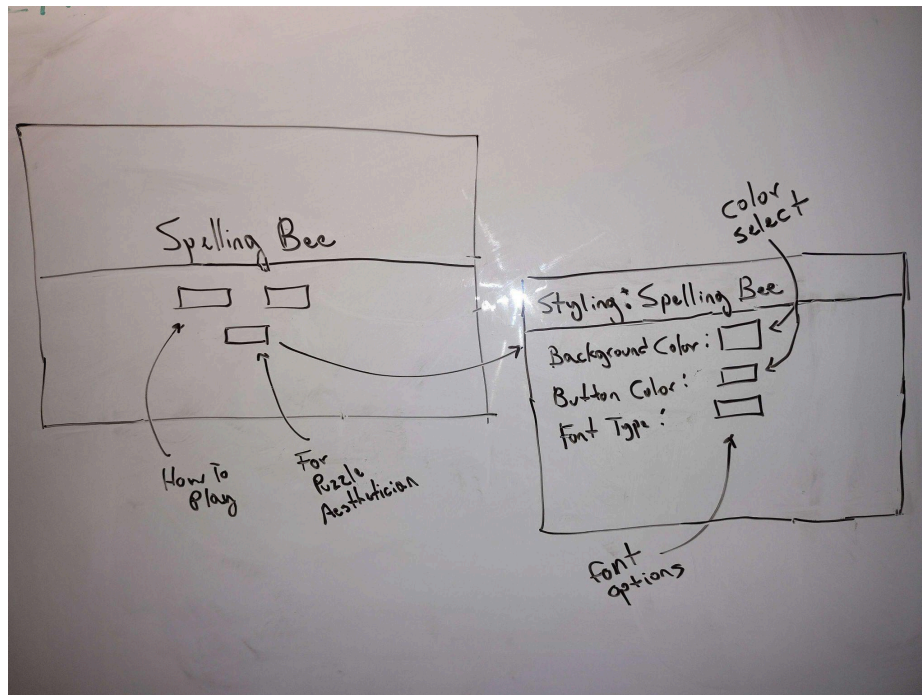
*So that I can customize Spelling Bee*

*I want to navigate to and change the styling of the Spelling Bee page*

**Story Points: 3**

**Implementation Status: Complete**

**Original UI Mockups:**

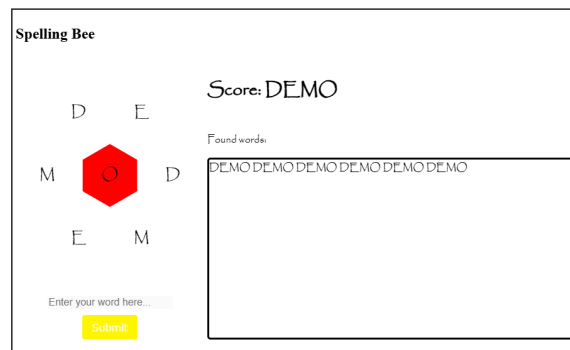


## Final Implementation:

Howdy Antonio!



### Edit Aesthetic



## Feature: Puzzle setting for Wordle

As a puzzle setter for game Wordle

So I can change the words Wordle

I want to navigate to the puzzle setter page for Wordle

Story Points: 3

Implementation Status: Complete


Final Implementation:



Wordle Word Plays

Click on any row for more actions

Play date ▲ ▼	Word ▲ ▼
2024-11-28	tripe
2024-11-26	arena
2024-11-25	filer
2024-11-24	pesto
2024-11-22	ethic
2024-11-18	rally
2024-11-16	vouch
2024-11-15	whole








[New Wordle Play](#)[Wordle Dictionary](#)


Feature: Puzzle setting for Spelling Bee

As a puzzle setter for game Spelling Bee  
So I can change the word of the day for Spelling Bee  
I want to navigate to the puzzle setter page for Spelling Bee

Story Points: 3  
Implementation Status: Complete  
Final Implementation:

Upcoming Spelling Bees

Date	Letters							Edit
November 29	R	U	C	O	I	S	K	
November 30	B	A	S	T	H	Z	O	
December 01	E	C	O	N	Z	T	K	
December 02	N	A	H	I	B	V	O	
December 03	D	S	H	E	I	U	G	
December 04	A	P	R	S	U	F	W	
December 05	D	G	E	O	L	H	Q	



Feature: Wordle Puzzle Configuration for Setters

As a puzzle setter for Wordle  
So that I can set the daily Wordle word  
I want an editing page where I can view and change the current word of the day.

Story Points: 2  
Implementation Status: Complete  
Final Implementation:



Howdy Antonio!

View Word Details

Play Date:	2024-11-28
Word:	tripe
Definition:	n The lining of the large stomach of ruminating animals, when prepared for food.

Back to Wordle Plays

Feature: Letter Boxed Game

As a user

So that I can play Letter Boxed

I want to be able to navigate to the Letter Boxed page and play the current game

Story Points: 4

Implementation Status: Complete

Final Implementation:

Howdy Antonio!

Letter Boxed

Reset Game

O

D

Y

I

W

M

S

E

A

U

Z

G

q

DELETE

ENTER

Number of Words: 6

AGO

AWAY

GAZA

MEDIA

SUM

YAG

Feature: Letter Boxed Game UI and Aesthetics

As a puzzle aesthetician

So that I can customize Letter Boxed

I want to navigate to and change the styling of the Letter Boxed page

Story Points: 3

Implementation Status: Complete

Final Implementation:

Howdy Antonio!



Edit Aesthetic

Box Color

Line Color

Unused Letter

Used Letter

Font

Font Verdana

Letter Boxed

D

W

P

E

U

X

B

M

R

I

O

A

Number of Words: 1

DEMO

Enter your word here

Delete

Enter

Feature: Letter Boxed Puzzle Setter

As a puzzle setter  
So that I can customize Letter Boxed  
I want to navigate to and change the available letters for Letter Boxed

Story Points: 4

Implementation Status: Complete

Final Implementation:

Upcoming Letter Boxed

Date	Letters												Edit
November 29	i	u	a	r	c	b	g	m	t	d	l	k	
November 30	t	c	s	d	i	e	a	r	f	u	n	g	
December 01	i	r	e	k	f	s	h	u	v	o	g	c	
December 02	u	o	e	r	f	i	b	m	z	c	t	a	
December 03	i	n	o	g	a	e	r	u	d	t	z	c	
December 04	b	u	i	a	n	k	h	p	t	r	s	v	
December 05	i	s	r	e	b	o	u	z	m	n	x	c	



Feature: Wordle Puzzle Setter Word List

As a puzzle setter  
So that I can configure the possible words for Wordle  
I should be able to see the entire list of possible words.

Story Points: 2

Implementation Status: Complete

Final Implementation:

Howdy Antonio!



## Wordle Dictionary

Search and Sort Options

sahod  
aaliii  
aargh  
aarti  
abaca  
abaci  
aback  
abacs  
abaft  
abaka  
abamp  
aband  
abase  
abash  
abask  
abate  
abaya  
abbas  
abbad  
abbas  
abbey  
abbot  
abcce  
abeam  
abear  
abele  
abers  
abets  
abhor  
abide

Update Wordle Dictionary

Back to Wordle Plays



## Feature: Wordle Setter Dictionary Updates

*As a puzzle setter*

*So that I can configure the possible words for Wordle*

*I should be able to modify the dictionary of possible words.*

**Story Points: 4**

**Implementation Status:** Complete


**Final Implementation:**

×

### Select Input Type

Select a file to upload from or directly enter input into the text box.  
 If uploading a file, you can verify words to be added and make neccessary modifications in the text box before submitting.  
*Words must be 5 characters long, should only contain alphabets and should be newline separated.*

No file chosen



### Select Update Option

☒ Add provided words to dictionary  
☐ Replace all words in dictionary with provided words  
☐ Remove specified words from dictionary

### Specify Words Category

☐ Are these words valid solutions?

## Feature: Overall UI Improvements

*As a user*

*So that I can smoothly interact with the application*

*I should have a smooth user experience*

**Story Points: 4**

**Implementation Status:** Complete

Implementing this last story involved the complete overhaul of many UI elements throughout the application. Most notably, we updated the Wordle puzzle setter pages, the user settings overlay, and various smaller components like buttons and icons.

## Roles:

Sprint	Product Owner	Scrum Master
1	Tejas Singhal	Nandinii Yeleswarapu
2	Junchao Wu	Antonio Rosales

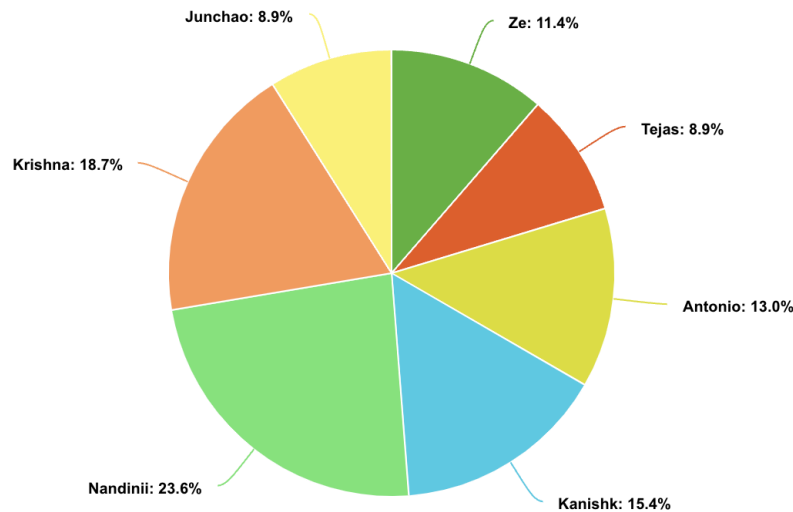
3	Krishna Calindi	Kanishk Chhabra
4	Krishna Calindi	Ze Sheng

## Sprint Goals:

Sprint	Story Points	Accomplishments
1	25	Deployment, OAuth login, basic landing page
2	35	Spelling Bee, Wordle, System Admin, Settings
3	40	2048, Letter Boxed, bug fixes, puzzle setter and puzzle aesthetician implementation
4	23	Dashboard integration, bug fixes, refactoring, documentation

## Sprint-wise Story Point Distribution:

Team	Sprint 1	Sprint 2	Sprint 3	Sprint 4	Total
Ze	5	5	4	0	14
Tejas	3	2	5	1	11
Antonio	3	2	5	6	16
Nandinii	4	10	9	6	29
Krishna	3	10	8	2	23
Junchao	3	2	4	2	11
Kanishk	4	4	5	6	19
	25	35	40	23	123



## Customer Meetings:

### Sep 26, 2024 Sprint 1 Planning

During this meeting, the client gave us his vision for the project and we discussed the general requirements for the application.

The objectives for the first sprint were defined as:

1. Have the Arcade app successfully deployed with account creation and login set up.
2. Have the app be able to distinguish between player, puzzle setter, puzzle aesthetician and system admin users.

### Oct 3, 2024 Sprint 1 Check-in

In this meeting, we showed the client the following features:

1. The account creation and login functionality with Google OAuth.
2. The ability for the application to recognize whether a user has a 'System Admin' or 'Member' role.

We also asked for further clarification on the all-users list and how it should be structured.

### Oct 9, 2024 Sprint 1 MVP / Sprint 2 Planning

In this meeting, we showed the client the following features:

1. The account creation and login functionality with Google OAuth.

2. The ability of the application to distinguish the user's role.
3. The all-users list is available to system admins.

We then discussed what our priorities should be for sprint 2. The client agreed that our goal for sprint 2 should be:

1. Implement the Spelling Bee game and allow its aesthetics to be configured
2. Implement the Wordle game and allow its aesthetics to be configured

#### Oct 17, 2024 Sprint 2 Check-in

During this meeting, we showed off the Spelling Bee game and aesthetic configuration. We also showed the client a non-functional Wordle page so he could critique it. The client gave us pointers on how to improve the way the user interacted with the aesthetic configuration; for instance: a major suggestion was to include a preview within the configuration page.

#### Oct 21, 2024 Sprint 2 MVP

This meeting, we demoed the following features:

1. The ability for system admins to view and manage roles in the users page
2. The updated Spelling Bee pages
3. The Wordle game and its aesthetic configuration

The client also suggested further improvements to the all-users page. Namely, he suggested that role management for each user should be separated from the all-users list.

#### Oct 24, 2024 Sprint 3 Planning

During this meeting, we discussed what our goals for sprint three should be with the client. The client agreed that our goals should be:

1. Implement the 2048 and Letter Boxed games
2. Allow for puzzle setters to configure Wordle and Spelling Bee
3. The role management page for individual users

#### Oct 31, 2024 Sprint 3 Check-in

The team demonstrated the following features for the client:

1. The 2048 game and its aesthetic configuration
2. The updated UI for the all-users page (role badges and OAuth provider list)

The client provided numerous criticisms for the Wordle puzzle setter experience which we planned to address for our next meeting.

Nov 6, 2024 Sprint 3 MVP / Sprint 4 Planning

The team demonstrated the following features for the client:

1. The Letter Boxed game and its aesthetic configuration
2. The finalized UI for user-role management
3. The updates to Wordle puzzle setter experience

The client once again provided criticism for the Wordle puzzle setter experience. We clarify the means by which puzzle setters should be able to add, replace, and remove words from the Wordle dictionary.

The client also outlined how puzzle setting should be handled for Letter Boxed.

Finally, we discussed what the team should focus on for the last sprint. The client suggested that we make sure all functionality was working for the four games that were implemented, and that some UI/UX elements should receive improvements (e.g. all overlays throughout the app).

Nov 14, 2024 Sprint 4 MVP

For our final meeting, we demoed the following features:

1. The puzzle setter configuration for Letter Boxed
2. The final version of the Wordle puzzle setter experience
3. An updated UI for Spelling Bee

We also received a final clarification on what attributes should be sortable in the all-users page.

## Process (BDD & TDD):

Our development process for every sprint usually started by identifying what tickets to pull from the backlog. Once we identified the scope of the sprint, our product owners would create Cucumber tests. We would then begin the development process while ensuring our RSpec tests were flushed out at the same time. This ensured a smooth development process, while ensuring our total coverage never went below 90%. TDD also helped us identify many potential bugs before they made their way into production. Overall, following TDD helped us focus our efforts, catch bugs before they were deployed, and treated testing as an integral process in development rather than a metric to achieve.



## Configuration Management:

- main branch: stable, pre-deployment branch, unprotected
- prod branch: stable, deployment branch, protected
- feature branch: every JIRA ticket had its own branch including feature tickets and bug fixes
- 6 total releases: 4 major releases for each sprint and 2 patch releases to address important bugs.

## Deployment:

We implemented a continuous deployment process of software development. Our initial push to Heroku had a few issues with figuring out credentials. As we were completely averse to introducing variables in version control, (encrypted or not), we used environment variables that had a few troubles setting up. Heroku also needed a 'TZ' environment variable to set its time zone. The only thing we could not fix was an automatic rake task to set games a week into the future.

## Important Tools:

Tools	Usage
GitHub	Version control
CodeClimate	Code quality analysis
rubocop (gem)	Ruby standards
simplecov (gem)	Coverage reports
omniauth (gem)	OAuth login
yard (gem)	Documentation
rspec (gem)	Testing
cucumber (gem)	Testing

## Setup Guide:

Instructions on setting up the application for local development as well as to deploy to Heroku as a hosting production platform can be found under *documentation/Arcade Development Guide.pdf* in the github repository.

## Feature Tour:

A summary of the features supported by the application as well as required set up steps to enable and disable certain features can be found under *documentation/ArcadeFeatureTour.pdf* in the github repository.

## Links:

Deployed app: <https://csce606arcade-12ac8dd4dc24.herokuapp.com/>

GitHub: <https://github.com/tamu-edu-students/csce600-arcade>

Issue tracker: <https://tamu-team-pyr0027e.atlassian.net/jira/software/projects/>

Presentation video: <https://www.youtube.com/watch?v=nels2iMObGw>