CEN 4010 Principles of Software Engineering, Fall 2019
Milestone 5: Final Project Delivery and Demonstration
Owl Gamers

Team number: 5

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12/2/2019

3.2 Project Summary

1) Owl Gamers website featuring Captain Defender game
2) Committed functions:
    1. Game - The website will have a spinoff version of the Space Invaders game, called Captain Defender. Every user on the platform that has created an account can play the game and track their score as they're playing.
    2. User profile - After storing user information in the database, the user will be given the opportunity to personalize their own profile. They can select their own avi picture and post a bio. Username will be also displayed on every users page.
    3. User friends - Users will be able to search for and add other users in the game. The user has to go to their profile page, click on the add friends icon and it will redirect them to a search page. Here they can type in a username, if valid, and add the user to their friend list.
    4. Score page - There will be a universal score page for top ranking players. Having a universal high score function will add a sense of competitiveness and connection between the players. It will also be a great talking point amongst friends.
    5. Home page - The home page will be in place for user interaction. Users can post statuses and see their friend's statuses.

3) The unique features of our website are user interactions. Not only did we create a new alien invaders game, with our own unique twist to it, now there is a capability to have user interactions. If you score high enough, you can be amongst the top 10 on the site! You can post whatever you want as a status, and keep up with other users on the platform.
4) https://lamp.cse.fau.edu/~cen4010fal19_g05/milestone3/login/
Once you create an account you can log in. There you will have a personal user profile page. You will be able to navigate to the game, search for other users or go to the home page. (all features are still not a 100% implemented)

3.3 Milestone Documents

1.)Milestone 3:

Executive Summary

The following is a proposal for a Principle of Software Engineering Project consisting of a web-based video game. The game is an arcade shooter game in which the player uses a fixed shooter to defend their base from incoming enemy ships. The name of the game is Captain Defender. The objective of the game is to defeat wave after wave of enemy ships with a vertical-shooting laser weapon, much like Space Invaders.

This project is solely software-based and does not require any hardware. The game will only be accessible by registered users so a log-in and registration page will be provided. The user's information will be stored in a database. Once a user signs in, they will be able to start the game. The purpose of the game will be to defend a home baseline at the bottom of the screen from invading ships. The game will allow for linear horizontal movement and vertical projectiles. If a projectile hits an invader, the invader will be destroyed and disappear. If the user can defeat all the invaders, they win, and if not, they lose the game. The high score of the user will be stored on their personal profile page and are automatically updated on the top 10 high scores(if applicable) on the scores page, that can be viewed by any user on the platform. The website will run on a server with limited access by any user. By including this feature the user will be able to add players and track their achievements on the scores page if high enough to be apart of the top 10 achievers on the site. A separate tab will be dedicated to user interactions with others on the platform. A feature to post statuses will promote communication between others.

Our motivation for developing this project is to create a fun user platform where gamers can gather, play a fun game and be social. The whole team is highly motivated in creating a fun experience for everyone and we believe gaming is a huge industry with lots of opportunities.

The average teenager and young adult will most likely delve into some sort of gaming, whether it be a console, PC or mobile. We want to give the user a unique PC gaming experience they will be able to share with friends and strangers online, compete, connect and share statuses. This project can eventually lead to a whole online gaming platform with many other games to match everyone's taste and style.

Competitive Analysis

Captain Defender (Personal)	**Space Invader (Competitor)**
Statuses	No user to user interaction
Friends	Single-player use only
User account	No storage of user information
Top 10 High Score Achievements	Arcade use only

The game will have the same features as the competitor as well as the features of the team as listed in the table above. Captain Defender will have all the features listed above. There are multiple features that differentiate Space Invader and Captain Defender. Captain Defender is designed to be the definitive edition of both games. Learning from the archaic features of Space Invader, Captain Defender will improve on the shortcomings of the original game as well as staying true to what made the original so unique. Captain Defender is going to be more interactive than previous versions of similar games like Space invaders. The user is going to be able to view a friend's activity through statuses, have a profile and possibly showcase their high score on the top 10 high scores page to every user on the platform. Captain Defender's unique feature is that other games like it do not have a player to player interaction like our game. Our game will also change themes as the user progresses through the levels for a more versatile and entertaining user experience.

Data Definition

Attack - The amount of damage the player or enemy does to their opposition.

Attack Multiplier (AM) - The number that amplifies the enemy's attack.

Bootstrap – open-source CSS framework for front end development.

Captain Defender – a game character played by the user. Captain Defender will have to defend his turf.

CSS- Cascading style sheets is a stylesheet language, that describes documents written in HTML or XML. It also describes how elements should be rendered on screen, on paper, in speech, or on other media.

Cyberduck - is an open-source client for FTP and SFTP. Cyberduck is written in Java and C#.

Database- A structured set of data held in a computer, especially one that is accessible in various ways.

Defense - The amount of damage that is reduced from the player every time the enemy hits the player.

Eclipse – an integrated development environment (IDE) used in computer programming.

FTP – The File Transfer Protocol is a standard network protocol used for the transfer of computer files between a client and a server on a computer network.

Heads Up Display (HUD) – displays the source and will display a progress bar in future updates

Health Points - The number of hits the player can receive before the game ends.

High Score - The highest amount of points the player has received while playing the game.

Home Base – The player has to protect his turf from the Invaders. A place the player can be in without the threat of the invaders.

Html – HyperText Markup is a standard markup language for creating web pages.

Java – General purpose computer programming language that is concurrent, class-based, object-oriented, and specifically designed to have as few implementation dependencies as possible.

JavaScript – is a lightweight, interpreted, or just-in-time compiled programming language with first-class functions.

Junit – is a widely used testing framework along with Java Programming Language.

LAMP Server – Is an open-source Web development platform that uses Linux as the operating, apache as the Web server, MySQL as the relational database management system and PHP as the object-oriented scripting language**.**

Microsoft Visual Studio – is an integrated development environment (IDE) from Microsoft. It is used to develop computer programs, websites, and web apps.

Score – points earned from performing well in the game

Session – a session is a temporary and interactive information interchange between two or more communicating devices, or between a computer and user.

SFTP – the SSH File Transfer Protocol is a network protocol that provides file access, file transfer, and file management over any reliable data stream.

Shields – Placed in front of the player to block some of the damage the invaders' shoot.

Space Invaders – is a 1978 arcade game created by Tomohiro Nishikado. Space Invaders is a fixed shooter and set the template for the shoot ‘em up genre.

Swarm – A large number of enemies or invaders.

The player – controls the Captain Defender using the keyboard and tries to get the highest score possible.

Themer – The subject matter the game is built around.

UML – Unified Modeling Language

UML Diagram – is a diagram that visually represents a system along with its components.

World Invaders – enemies to be destroyed in the game. These will try to take over Captain Defender's turf.

Overview Scenarios and Use Cases

Our website will greet the user with a login page. If the user does not have an account, they will have to sign in and create one by inputting their full name, email address and creating a password. Once they are signed in or logged in they can proceed to the game. They can start the game and if they win the game resets. If they lose, they fail and the game restarts. The score updates as the player shoots invaders. If the score is high enough, it will be displayed as the top 10 scores amongst everyone on the website. They can also post a status about it which others can see. If the user does not want to play the game, they can go to the status page and see what other users are up to. Here they can read other statuses and feel like they are connected to the other users on the page.

<u>Use Case Scenarios:</u>

1. John goes to the webpage and is greeted by a login page. He does not have an account so he must use the sign-up page. He must input his full name, username, email address and password. Once he's signed in with the correct information, he has access to the website. He can start by selecting an avatar for his icon. He also has the right to enter a short bio that appears on his profile card. Then he enters the gaming portion of the website. He starts playing the game. He loses the first time, so the game resets and he tries again. He wins and reaches a high score. He finishes the game and signs out.
2. Jenna has created her account on our website. She logs on and plays the game. She feels as if she got an amazing score and wants to compare it with her friends on the

website. She goes to the achievements page and sees she ranks #2 amongst all the users on the website. She can post a status letting her friends know of her score.

3. Jim has created his account on our website. He logs in but does not want to play a game, instead wants to connect with his friends. He goes on the status page, reads their updates of all his friends. He then posts a status of his own to let his friends know how he's doing. He checks the scores page and tracks his friend's progression. He sees how everyone ranks on the website. He has checked up on statuses and scores and logs out.

High-Level Functional Requirements

1. The Database - The Owl Gaming website shall have a database that will hold all of the player's information.

   1.1 The players shall be able to see the Top 10 scores of the game by all players of Captain Defender.

   1.2 All of the information the player enters or achieves shall be stored in the database.

2. The Game - The Owl Gaming website shall have the Captain Defender game that allows players to gain points.

   2.1 The game shall be playable on the website and shall allow the player to gain points.

   2.2 The points scored shall be shown to the player.

   2.3 The player shall need to log in using their Owl Gamers account credentials in order to play the game.

3. Login Page - The Owl Gamers website shall have a login page to protect against unwanted users.
   3.1 The login page shall have users enter their information to access the game.
   3.2 After the user has created their account, they shall log in to the website using their newly created account.

4. User Profile - The Owl Gaming website shall have each user's high score posted on their profile.

   4.1 Each player shall be able to view their own high score.

5. Top 10 Scores Page - The Owl Gamers website shall have a Top 10 Scores page where players can view the Top 10 Scores of the game.

   5.1 This page shall display the scores of the Top 10 scores by the players of Owl Gamers.

List of Non-Functional Requirements

1. Usability - The Owl Gaming website shall be a gaming platform that welcomes new users and shall be easy to navigate through.

   1.1 Once users get a look and feel for the platform they can easily begin playing the game, seeing their high score on their profiles, and be able to view the Top 10 Scores of the game amongst all the players of Captain Defender.

2. Performance - The Owl Gaming websites response time should be 2 seconds or less starting with the login and applies to viewing each individual updated high score and viewing the Top 10 players scores.

   2.1 The website shall be able to support up to 50 players on the server at any given time to be able to maintain response time.

3. Security - The Owl Gaming website shall not execute commands embedded in data provided by users that forces the application to manipulate the database tables in unintended ways.

   3.1 No user shall be able to view any other users' personal information unless posted publicly by the user.

4. Maintainability - The Owl Gaming website and the game shall have a 90% probability that any errors encountered will be repaired within an hour.

   4.1 The coding shall be simple enough that future maintenance can be done quickly and efficiently, which means the coding is simple and adaptable to any new requirements.

5. Accessibility - The Owl Gaming website users shall be able to access their profile and update their information and icons at any time.

   5.1 No other users aside from yourself shall be able to change or view any of your personal information that is not public.

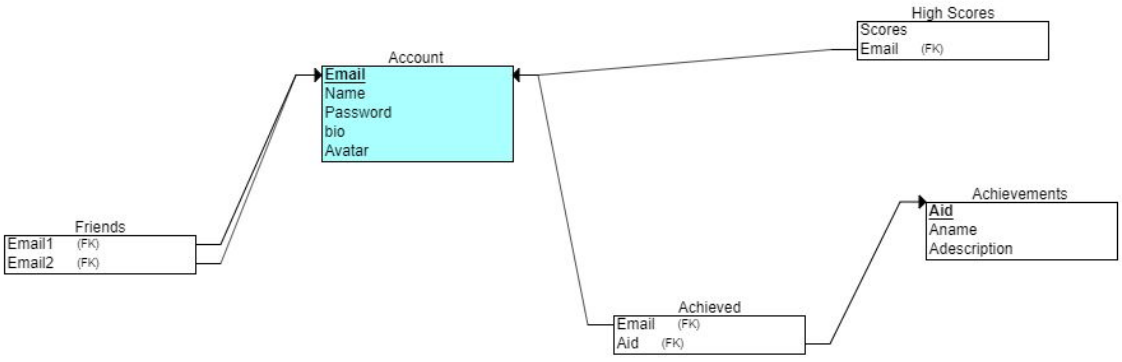
6. Data Storage - The Owl Gaming website shall store any and all personal information input to the website into a database such as Name, and Email.

   6.1 Individual players' high score shall be publicly viewable on their profiles.

7. Availability - The Owl Gaming website and game Captain Defender shall be available to any user who has created an account at any time in the day.

High-level system architecture and database organization

1. Most of the code has been written in PHP or HTML. The game will be coded in Java and will follow the class diagram in the High-Level UML diagrams section.

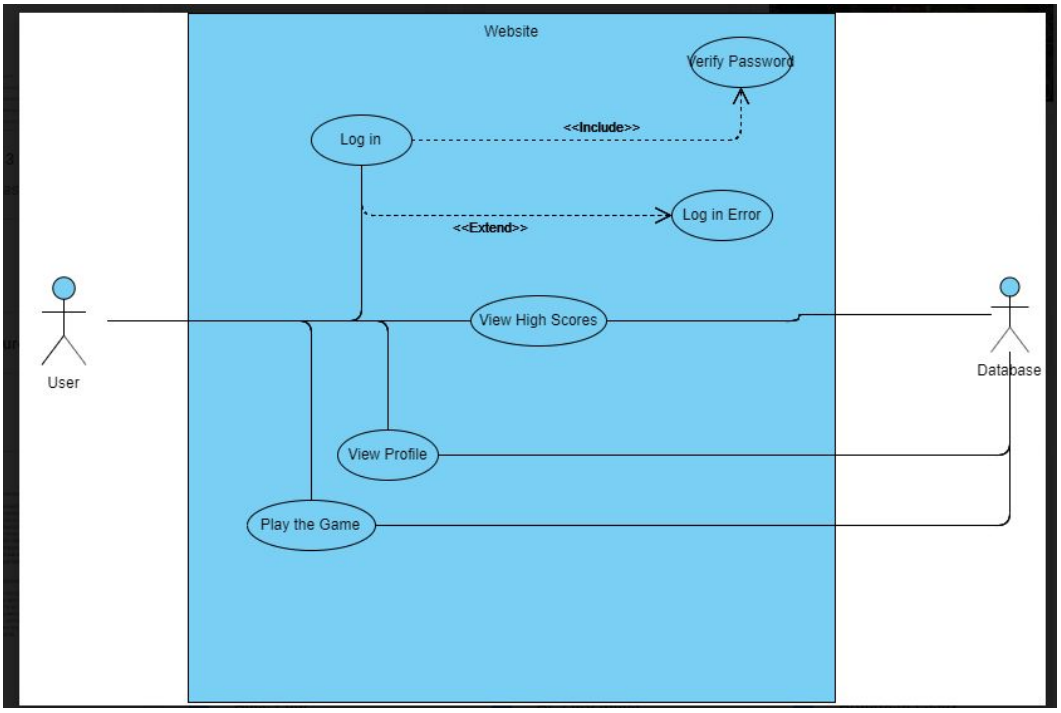


2.
3. Media Storage: The database will hold images and an audio file to play in the background for the game.

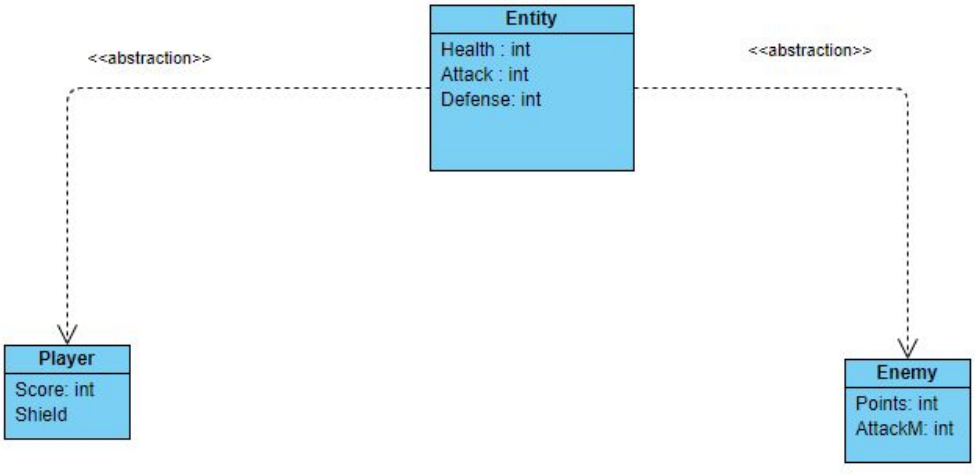
4. The terms that are searched for the database are the email, name, and scores of each user. The email is used to identify each user from each other, the name is displayed at the home page and the high scores will be filtered and sorted. The high scores page will display the highest scores and can be filtered based on the user.
5. The team can create a game that will be played through the website. This game will allow players to earn a score that will be stored in the database. The highest score will be on the user's profile page
6. The rating of the game will depend on the user's score. The higher the score, the higher the user will be placed on the scores page.

High-Level UML diagrams

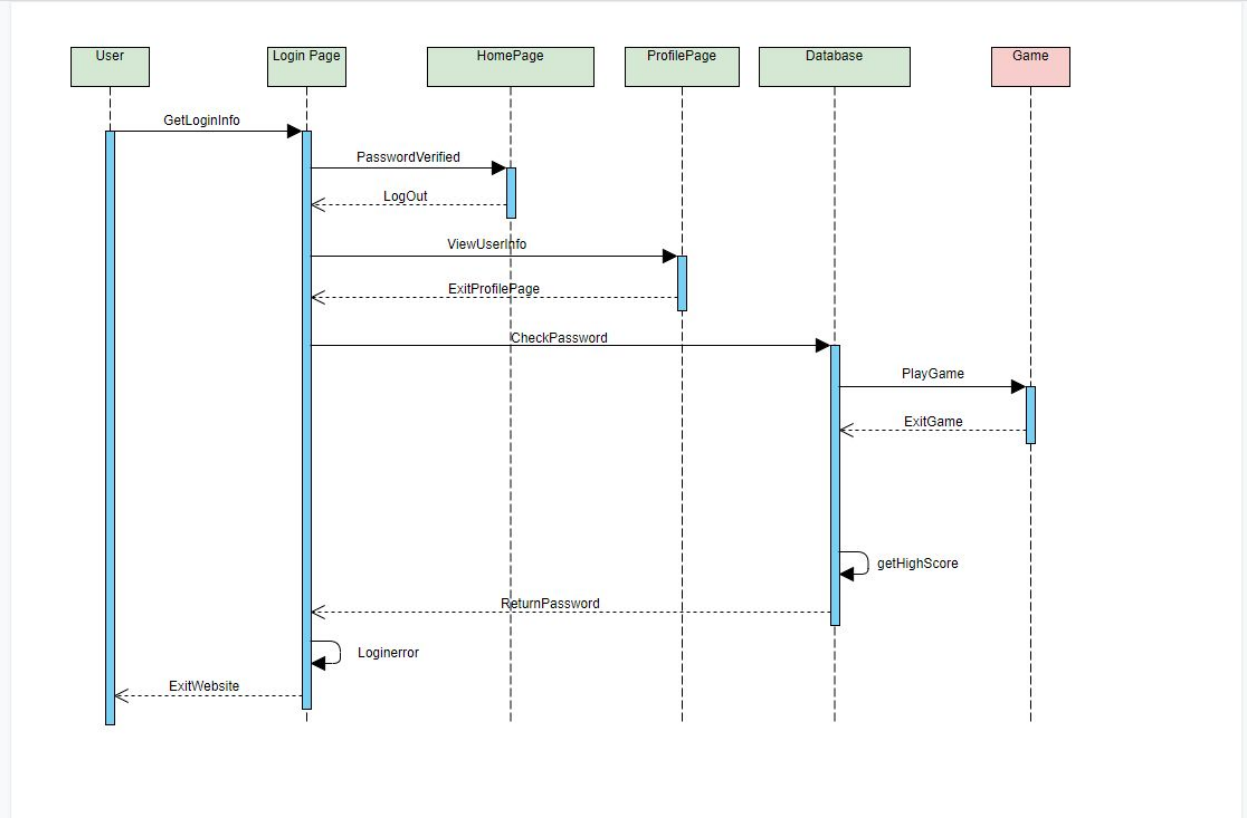
Use Case



Class Diagram



Sequence Diagram



Current Key Risks

ID	Date Raised	Risk Description	Impact	Severity	Owner	Mitigating action	Contingent action	Progress on action	Status
1	9/10/19	There is a skill risk, every team member is not proficient in all required concepts for building a website	Medium	Medium	Monika Spasovska Rolando Leiva	Speak to all team members and communicate individual skills. Every member is assigned a topic they are good in.	In case of a team member falling short on their assignment, Monika or Rolando will be contacted for help.If not, TA is contacted.	9/11/19 Team members have been assigned individual tasks. Tasks are based off skill level	Resolved

ID	Date Raised	Risk Description	Impact	Severity	Owner	Mitigating action	Contingent action	Progress on action	Status
2	10/8/19	There is a schedule risk. Due to three out of four students being distance learners and personal time constraints physical meetings can not happen	Low	Low	Monika Spasovska Rolando Leiva	A WhatsApp and Discord have been set up for group communication. Methods of communication have been agreed upon with the group members.	If personal time conflicts prohibit group members from making the online meetings, they are responsible for completing their task before meeting.	25/8/19 - now WhatsApp used as primary communication 10/12/19 Discord meeting, everybody present 11/2/19 WhatsApp task assignment, Gandhi not present	Active

ID	Date Raised	Risk Description	Impact	Severity	Owner	Mitigating action	Contingent action	Progress on action	Status
4	17/10/19	There is a teamwork risk. Members are not participating in completion of milestones or website. Members are not communicating with team	High	High	Monika Spasovska Rolando Leiva	Issue has been communicated to teacher and non participating group members. Group members have been given another chance at participation.	Future milestones will contain a peer evaluation form. If group member refuses to communicate or participate, they will be given an appropriate grade.	21/10/19 Stephanie has participated in milestone 3 4/11/19 Gandhi has not participated in any task since milestone 1	Active

Peer Evaluation

Point Distribution:
Monika Spasovska- 37.5/25
Rolando Levia- 37.5/25
Stephanie Juan- 25/25
Gandhi Lucate- 0/25

2.)Document Teacher Comments

Milestone 3:
Functional requirements were not prioritized
Review risk and mitigation strategies
Milestone 4:
Fixing the section “code review” and “best practice for security”
Review objectives of test

3.4 Screenshots of Demo

Top Scores

'rleiva2017@fau.edu''1850000'

'laydes70@aol.com''850000'

'laydes70@aol.com''60000'

'FAU123@fau.edu''50000'

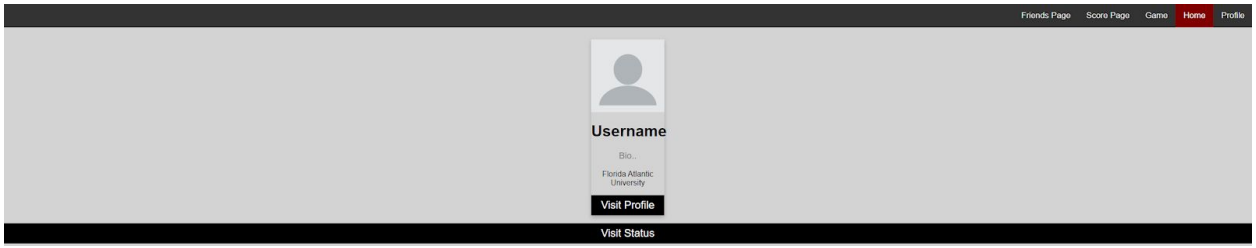
'Etaylor2015@fau.edu''20000'

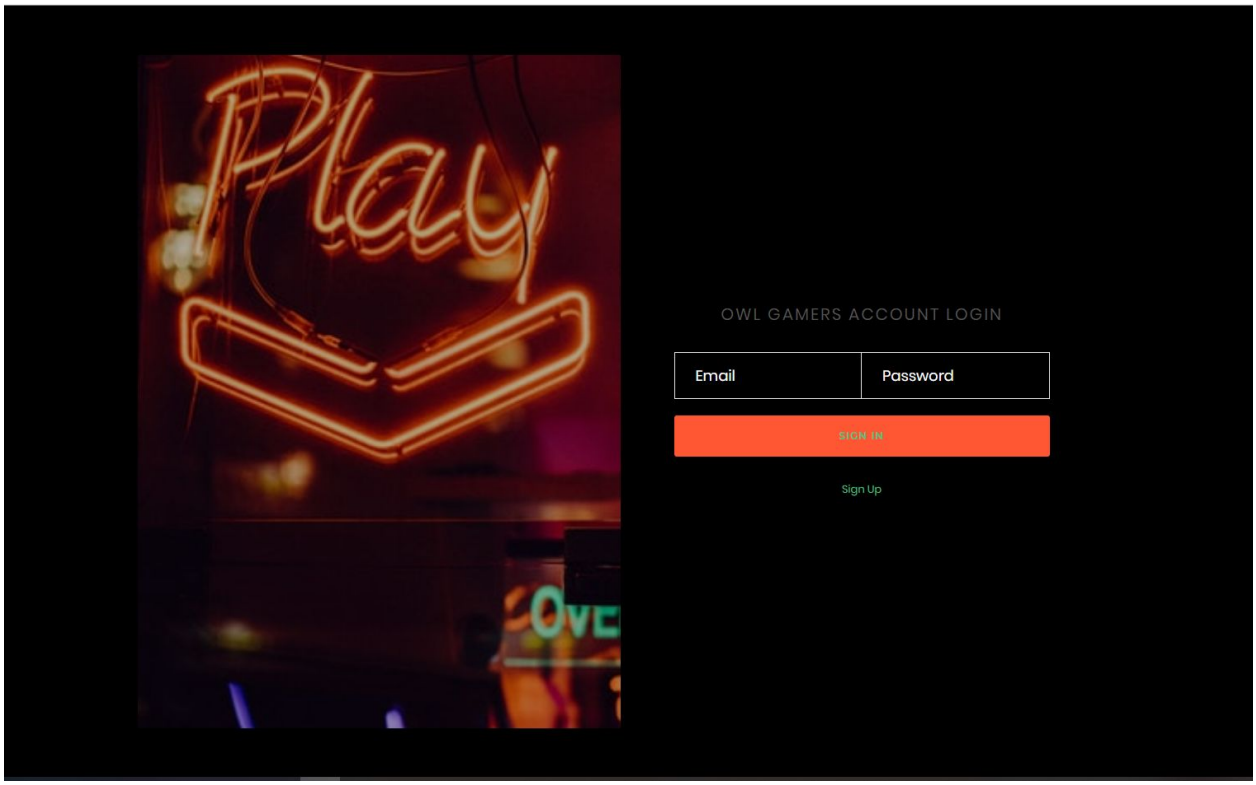
'Etaylor2016@fau.edu''15000'

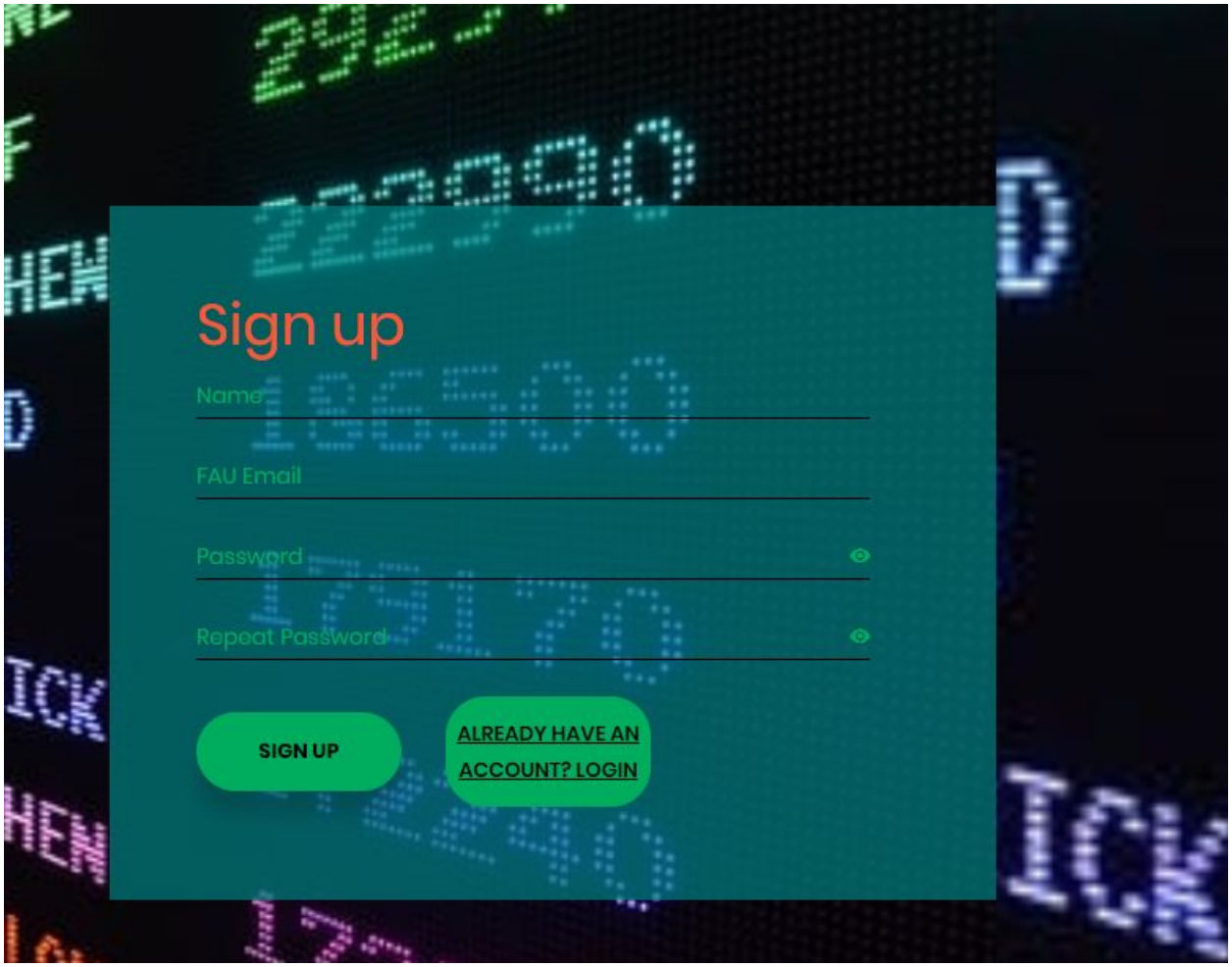
'Etaylor2015@fau.edu''10000'

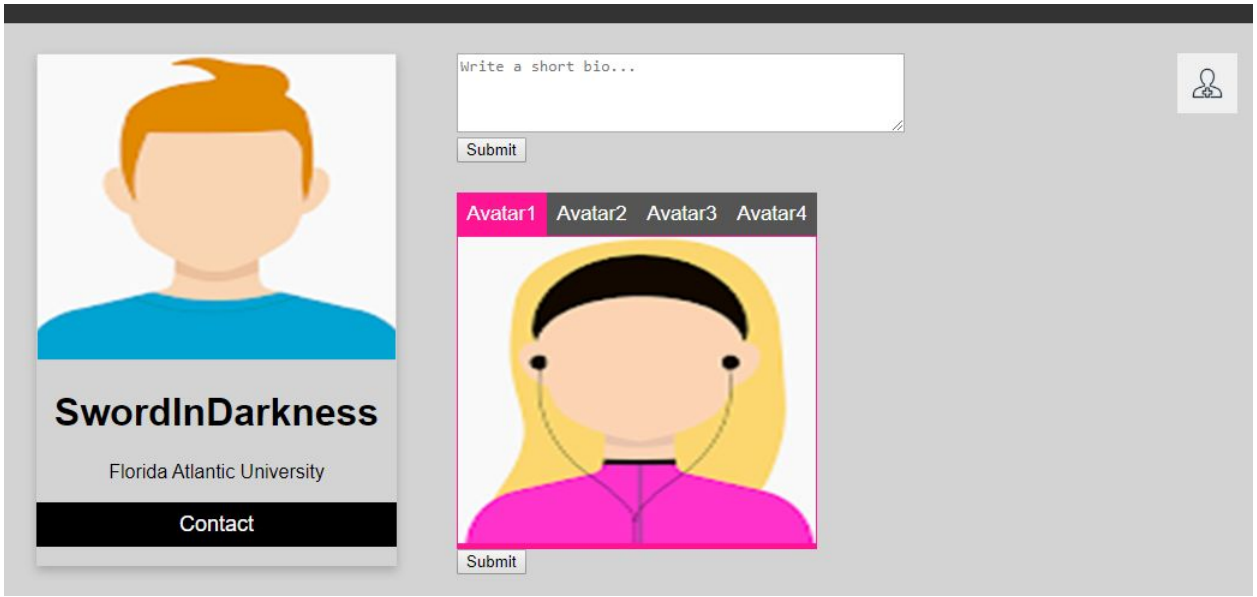
'Etaylor2016@fau.edu''5000'

'rleiva2017''2500'


Friends Page
Score Page
Game
Home
Profile
Username
Bio..
Florida Atlantic University
Visit Profile
Visit Status

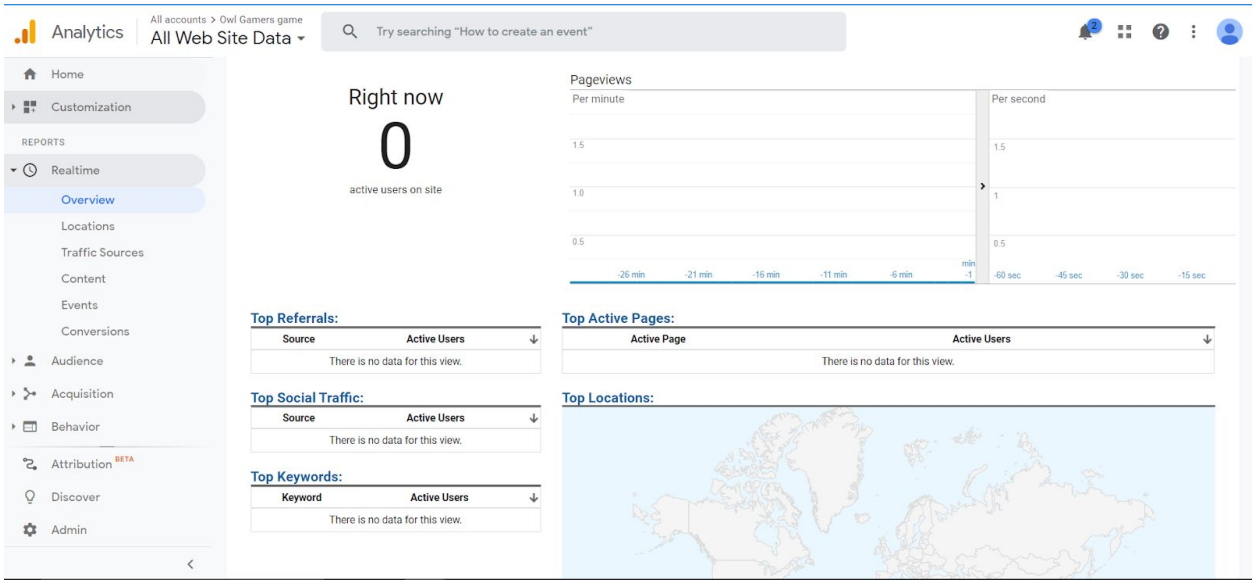

Play
OWL GAMERS ACCOUNT LOGIN
Email
Password
SIGN IN
Sign Up





3.5 Google Analytics Plot

With Google Analytics we have all the pages being reviewed for the traffic and speed response times, it says it takes approximately 24 hours to view the results so we were not able to view them just yet.



3.6 Team Member Contribution

1) Monika Spasovska: Role: Team lead. Created game,game page, profile page, score page and search/add friends page. Improved home page. Points: 37.5/25
   Rolando Leiva: Role: Scrum Master. Took lead on connecting the entire website to a database. Points: 37.5/25
   Stephanie Juan: Role: Development team. Created log in page, sign in page and worked on home page. Points: 25/25
   Gandhi Lucate: did not contribute. Points: 0/25
2) Monika Spasovska: Team lead. Sole game developer. Created and designed profile page, score page, search/add friends page and designed home page to fit the rest of the website's layout. Worked on and edited all milestone documents. Assigned the team tasks. Updated Trello board. Fixed member's errors.
   Rolando Levia: Rolando also created the connection between the database and the website. He was responsible for maintaining the database and it's the relationship to the website. Along with Monika, he edited and revised on the milestone documents after feedback was given to improve the team grade. He also helped and fixed many of the errors the other members had.
   Stephanie Juan: Development team member. Created and designed login page, signup page, and home page. Worked on ⅝ milestone documents. Updated trello according to things worked on.
   Gandhi Lucate: did not contribute.

3) Rolando took the role of uploading all code and milestones from Google Docs or CyberDuck to gitHub.

3.7 Post Project Analysis

The main challenges of the project were teamwork and developing features. The whole team was not on the same page when it came to the project so it was really difficult to try to gauge what could be done in a timely manner. Some students were better prepared than others to handle a project of this caliber, and work was not evenly divided among the team. Communication was not ideal, so it was difficult to track each student's progress. In-person meet-ups were not realistic, as three out of four students are distance learners so group chats were the main form of communication. In the end, we only had three out of the four students participate in the final product, leaving us to not be able to accomplish everything.

A better solution to this problem would be to keep the teacher notified so the efforts of the students who do participate do not go unnoticed and grades are reflected by their effort. In this way, the students who do not participate do not drag down those who do.

Another huge challenge we faced while developing this project was coding all the features we originally wanted to include. We aimed very high in our first meeting and wanted a lot of extra features for the website, but we were soon faced with the fact that we lacked both skill and manpower to accomplish all of this. As students, who have never had the exposure to a huge project like this, we quickly realized that including so many features and making our website look the way we wanted to was a bit out of reach. All of us are swamped with other classes and personal conflicts, so that type of commitment would be impossible.

A feature we wanted to create was commenting on statuses. We could not figure out how to do this. We lacked both skill and time, so we decided just to do statuses. Another feature we wanted to do was displayed achievements. If a player got a certain score it would automatically save and he/she could post it on the home page for everyone to see. This was again too complex and time-consuming to figure out in time.

A solution to this problem could have been picking a simpler project to do. If we did something simpler it could have looked a lot better. We did not realize that creating a social media gaming website would be as difficult as it proved to be. Even though the website we designed is not that bad if we took on something that everyone in the group knew how to do we could have designed something a lot better.

A lot of lessons were learned from creating this project. It is very difficult to create something from nothing, especially when you are working with a team you are not acquainted with. Skill sets and levels, motivation and commitments will vary from every team member. The most important thing is communication and finding a way to creatively utilize everyone's skill set to achieve the best product possible.