

2019

Project Report

CST2120 - Web Applications and Databases

Name: Farhaan Beeharry Mohammad Sa'ad
Student ID: M00681483
12/13/2019



Table of Contents

| | |
|-----------------------------------|-----------|
| Overview | 3 |
| Gameplay | 3 |
| Features | 3 |
| Additional features | 3 |
| Wireframe | 4 |
| - Homepage | 4 |
| - Game | 4 |
| - Sign Up | 5 |
| - Sign In | 5 |
| - How to play? | 6 |
| - Leaderboard | 6 |
| Screenshots | 7 |
| - Homepage | 7 |
| - Game / Play | 7 |
| - Sign Up | 8 |
| - Sign In | 8 |
| - Trailer | 9 |
| - Leaderboard | 9 |
| - Instructions | 10 |
| Additional info | 11 |
| - The header navigation bar | 11 |
| - The footer | 11 |
| - Play button on hover | 11 |
| Levels of the game | 12 |
| Level 1 | 12 |
| Level 2 | 12 |
| Level 3 | 12 |
| Level 4 | 12 |
| Level 5 | 13 |
| Level 6 | 13 |
| Level 7 | 13 |
| Level 8 | 13 |
| The game | 14 |

| | |
|-------------------------------|----|
| Playing the game | 14 |
| The food | 14 |
| How the snake dies? | 14 |
| Features of the game | 14 |
| Game Over..... | 14 |
| Scoreboard..... | 14 |
| Warning messages | 15 |
| Levels changed..... | 15 |
| Sound effects..... | 15 |
| Direction of the snake..... | 15 |
| The score..... | 15 |
| Features of the website..... | 16 |
| Error in fields..... | 16 |
| Show password..... | 16 |
| Signed in – username | 16 |
| Check session & redirect..... | 16 |
| Registration and Login | 17 |
| Registration..... | 17 |
| Sign in..... | 19 |
| The leaderboard..... | 20 |

Overview

My game is called **Snakes** and is based on the 1976 arcade game *Blockade*. In 1998, this game was remade, called Snakes and preloaded onto the Nokia 3310 phones which attracted a larger audience.

Snakes is an arcade game and the object of it is to guide a snake (drawn in the form of a line) throughout the platform. The snake will have to eat items on the display by simply running into them with its head. As it consumes eat item, the snake grows longer which makes controlling progressively more difficult.

Gameplay

In this game, the player will control a very short line with one end as the head of the snake to move across a bordered plane on the screen. As it moves, items (the snake's food) will be randomly placed across the plane. The player will have to guide the snake to run into the item with the head to eat it. As it eats each item, the snake will gain in length and another item will be placed, again randomly on the plane. Eat item eaten by the snake will bring 1 point to the user.

The player loses the game when either of the following happens:

- The snake run into the screen border
- The head of the snake run into its body
- The snake run into an obstacle or a trail if any.

Features

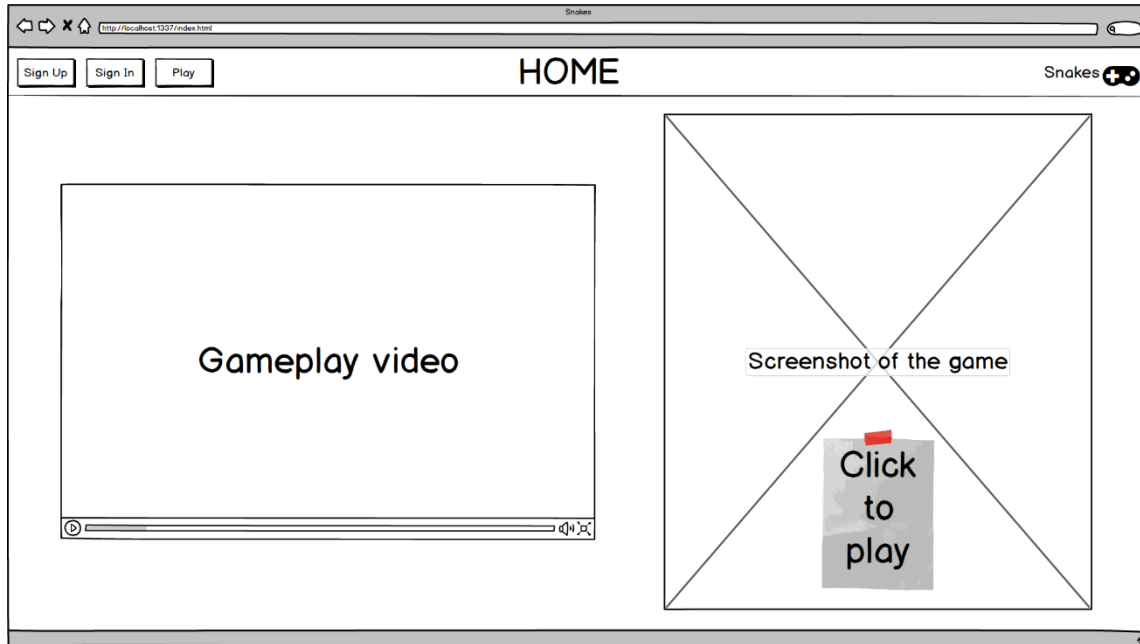
- The player will be able to control the snake in 4 directions (up, right, down & left).
- Items (snake's food) that appear on the screen can be eaten by the snake.
- The snake will die if it runs over itself, into an obstacle or the screen border.
- The player's score should be displayed and go up when an item is eaten.

Additional features

- Ability to login to be able to save scores achieved by the user.
- The game will have 3 levels (easy, medium & hard) whereby:
 - o Easy – screen border with snake moving slowly
 - o Medium – screen border with snake moving fast
 - o Hard – Obstacle placed on the screen with snake moving at medium speed.

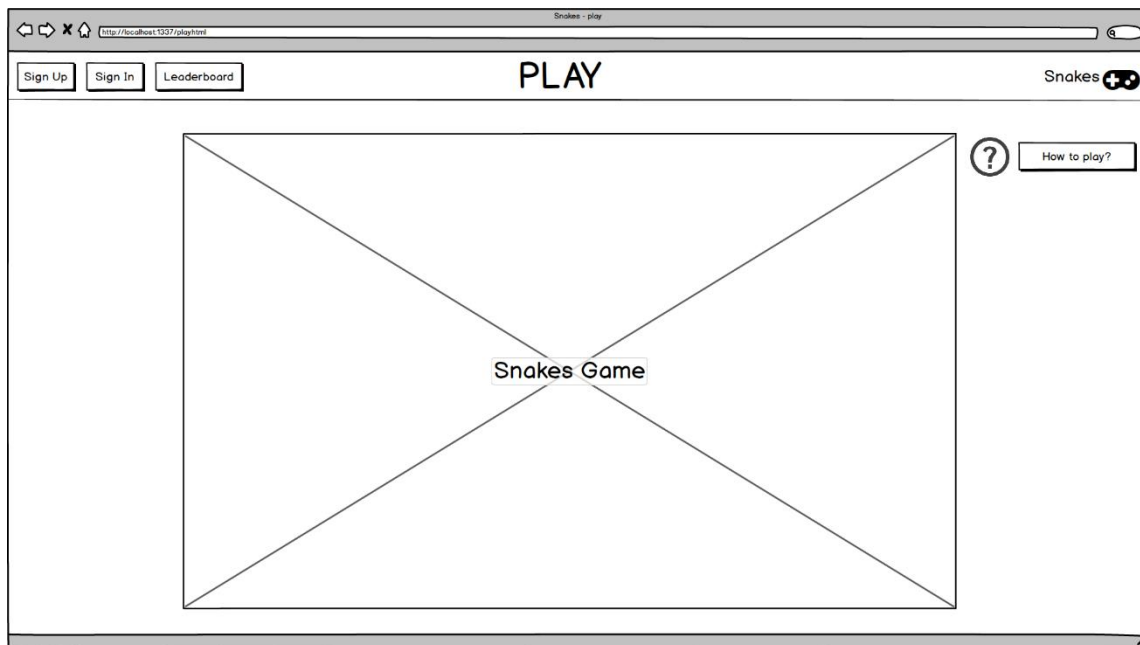
Wireframe

- Homepage



A simple homepage with a short gameplay video and a screenshot of the game. On clicking on the screenshot, the user will be redirected to the game.

- Game



- Sign Up



The screenshot shows a web browser window with the address bar displaying "http://localhost:5327/signup.html". The page title is "SIGN UP". In the top left corner, there are two buttons: "Sign In" and "Play as guest". In the top right corner, there is a logo that says "Snakes" next to a game controller icon. The main content area features a central form with a user icon (a person with a plus sign) at the top. Below the icon are several input fields: "First Name", "Last Name", "Username", "Date Of Birth" (with a calendar icon), "Gender" (a dropdown menu), "Email", "Phone Number", "Password", and "Confirm Password" (with an eye icon for toggling visibility). At the bottom of the form is a large "Sign Up" button. Below the form, there is a link that says "Already have an account? Sign In!".

The user will be able to create an account so that his/her score is saved and can be viewed and compared to other players' score on the leaderboard page.

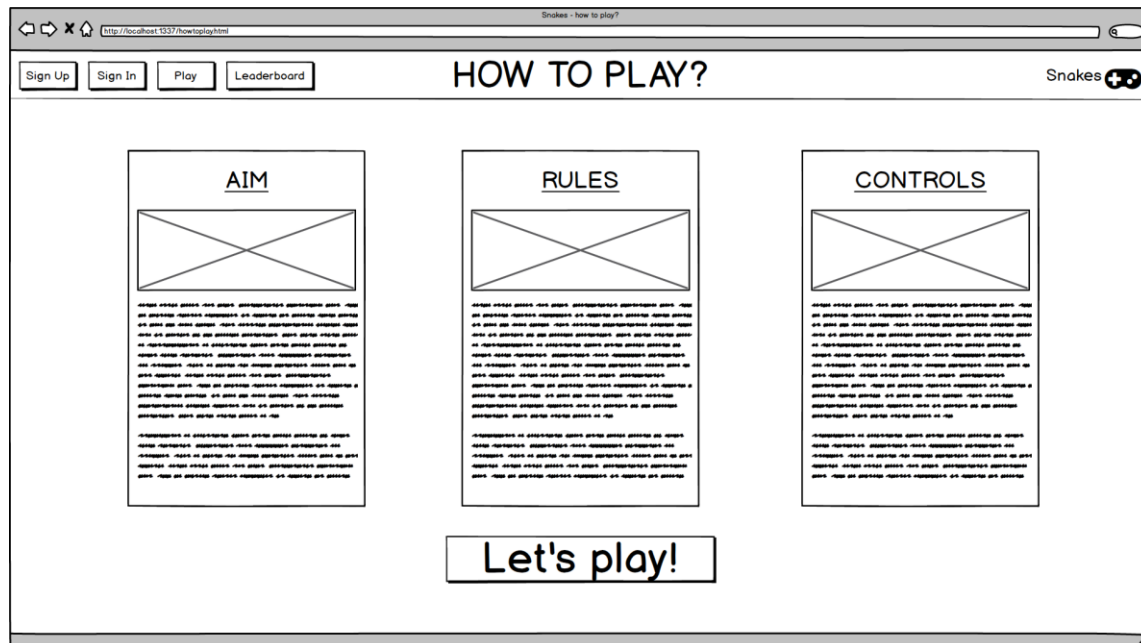
- Sign In



The screenshot shows a web browser window with the address bar displaying "http://localhost:5327/signin.html". The page title is "SIGN IN". In the top left corner, there are two buttons: "Sign Up" and "Play as guest". In the top right corner, there is a logo that says "Snakes" next to a game controller icon. The main content area features a central form with a user icon (a person) at the top. Below the icon are two input fields: "Username" and "Password". At the bottom of the form is a large "Sign In" button. Below the form, there is a link that says "Don't have an account yet? Sign up!".

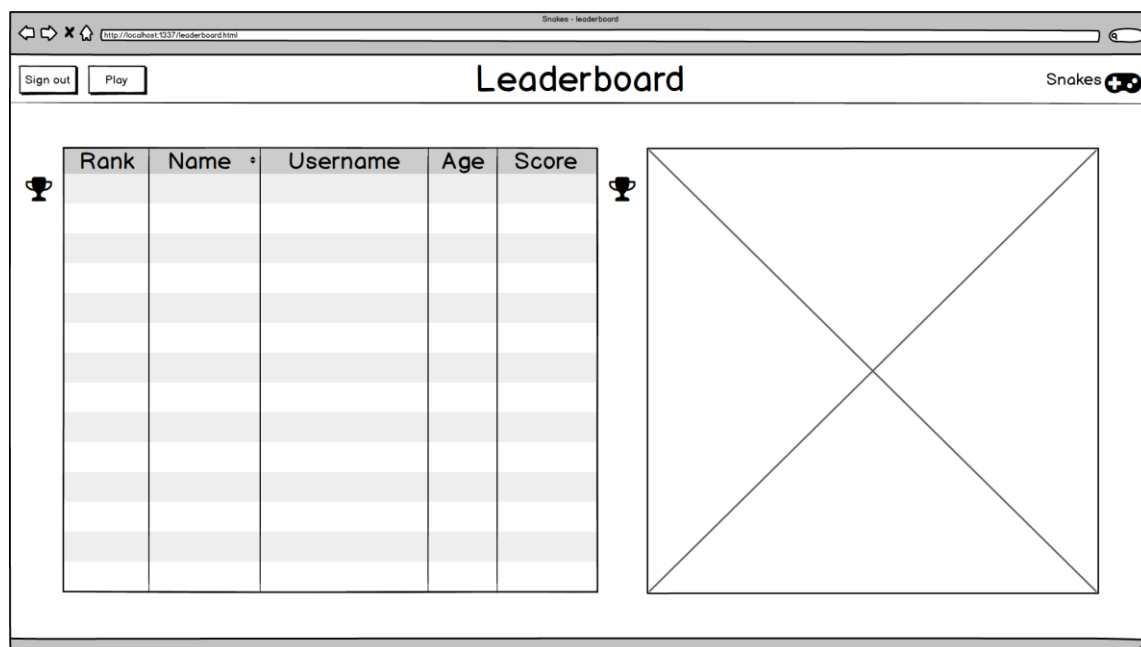
The user will have to sign in to be able to save his/her score in the leaderboard.

- How to play?



This page will teach the player how to play the game. The latter will be able to learn about the aim of the game, the rules and the controls to play the game.

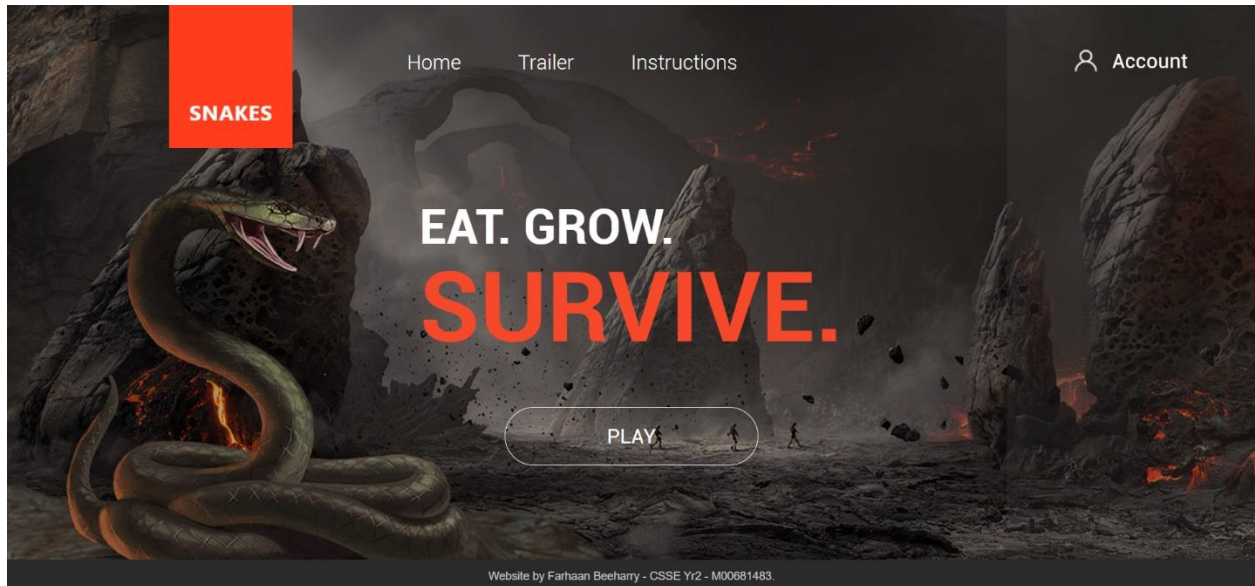
- Leaderboard



Here on the leaderboard page, the player will be able to view his/her score (signed in compulsory) and compare it to the score of other players who played before.

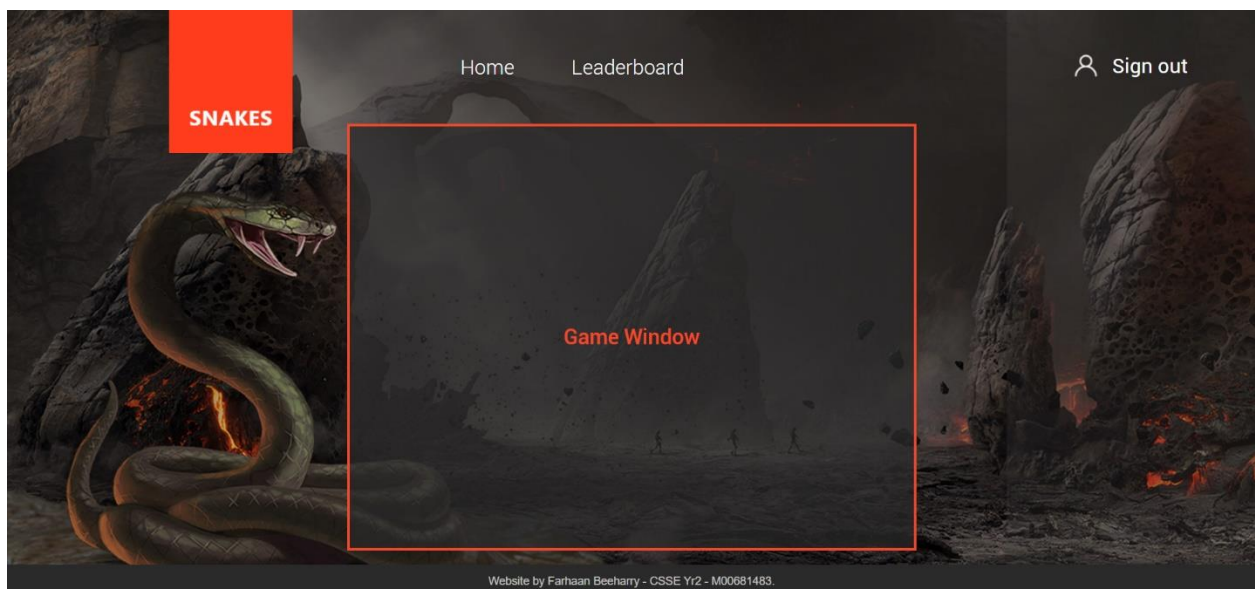
Screenshots

- Homepage



This is the homepage. On this page, the user can access the sign in feature of the website after which he/she shall be able to play the game. There is also a link to the instructions which will give more details about the game's aim, rules and. And a little trailer video which will give the user an idea of how the game shall be.

- Game / Play



This is the game/play page. On this page the game can be played and also a link to view the leaderboard is available.

- Sign Up

The screenshot shows a web page for a game called "SNAKES". In the top left corner, there is a red square with the word "SNAKES" in white. To the right of this, there are two links: "Home" and "Instructions". The main content area is a dark gray circle containing a white rounded rectangle. Inside this rectangle, the text "Sign Up" is displayed in red. Below it are three input fields labeled "username", "password", and "confirm password". A red button with the text "Sign Up" is positioned below the input fields. At the bottom of the white rectangle, there is a link that says "Already registered? Sign in!". At the very bottom of the dark gray circle, there is a small text credit: "Website by Farhaan Beeharry - CSSE Yr2 - M00681483".

On the sign-up page, the user will be able to create account so that he/she can play the game and also have his/her score saved in the leaderboard. There is a link to access the sign-in page if the player already has an account.

- Sign In

The screenshot shows a web page for a game called "SNAKES". In the top left corner, there is a red square with the word "SNAKES" in white. To the right of this, there are two links: "Home" and "Instructions". The main content area is a dark gray circle containing a white rounded rectangle. Inside this rectangle, the text "Sign In" is displayed in red. Below it are two input fields labeled "username" and "password". A red button with the text "Sign In" is positioned below the input fields. At the bottom of the white rectangle, there is a link that says "No account yet? Sign up!". At the very bottom of the dark gray circle, there is a small text credit: "Website by Farhaan Beeharry - CSSE Yr2 - M00681483".

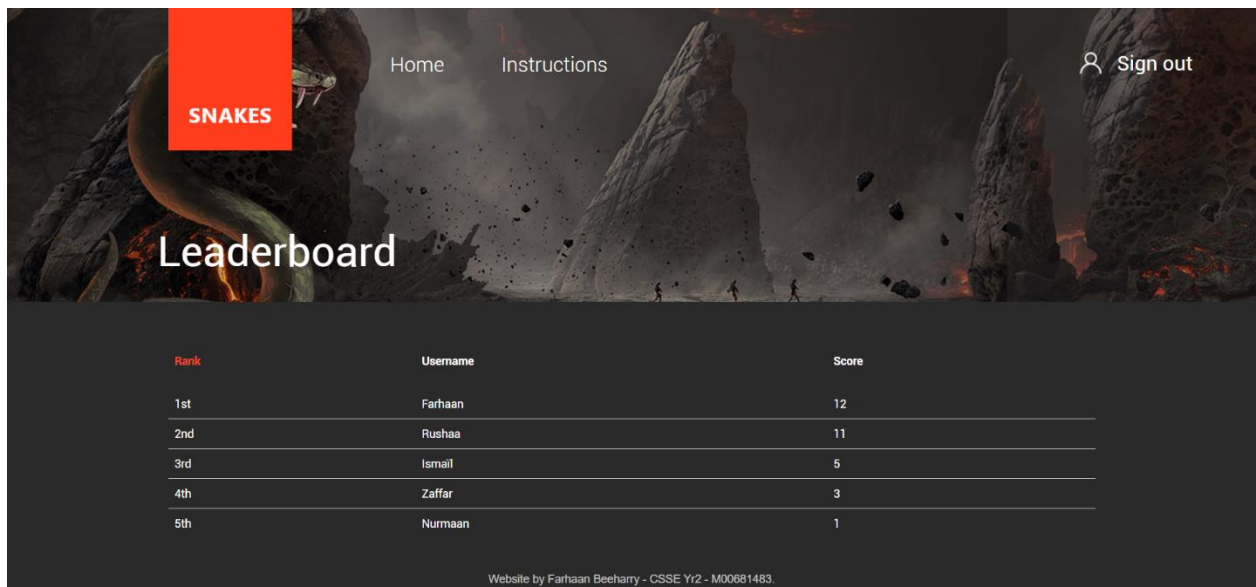
On the sign-in page, the user will be able to log into the game if he/she already has an account. In case the player doesn't have an account, there is a link to access the sign-up page.

- Trailer



On clicking the trailer link, a short video* of the gameplay shall appear which after watching the user will have an idea of how the game shall be. And on clicking outside the video, the user shall return to the page he/she was on.

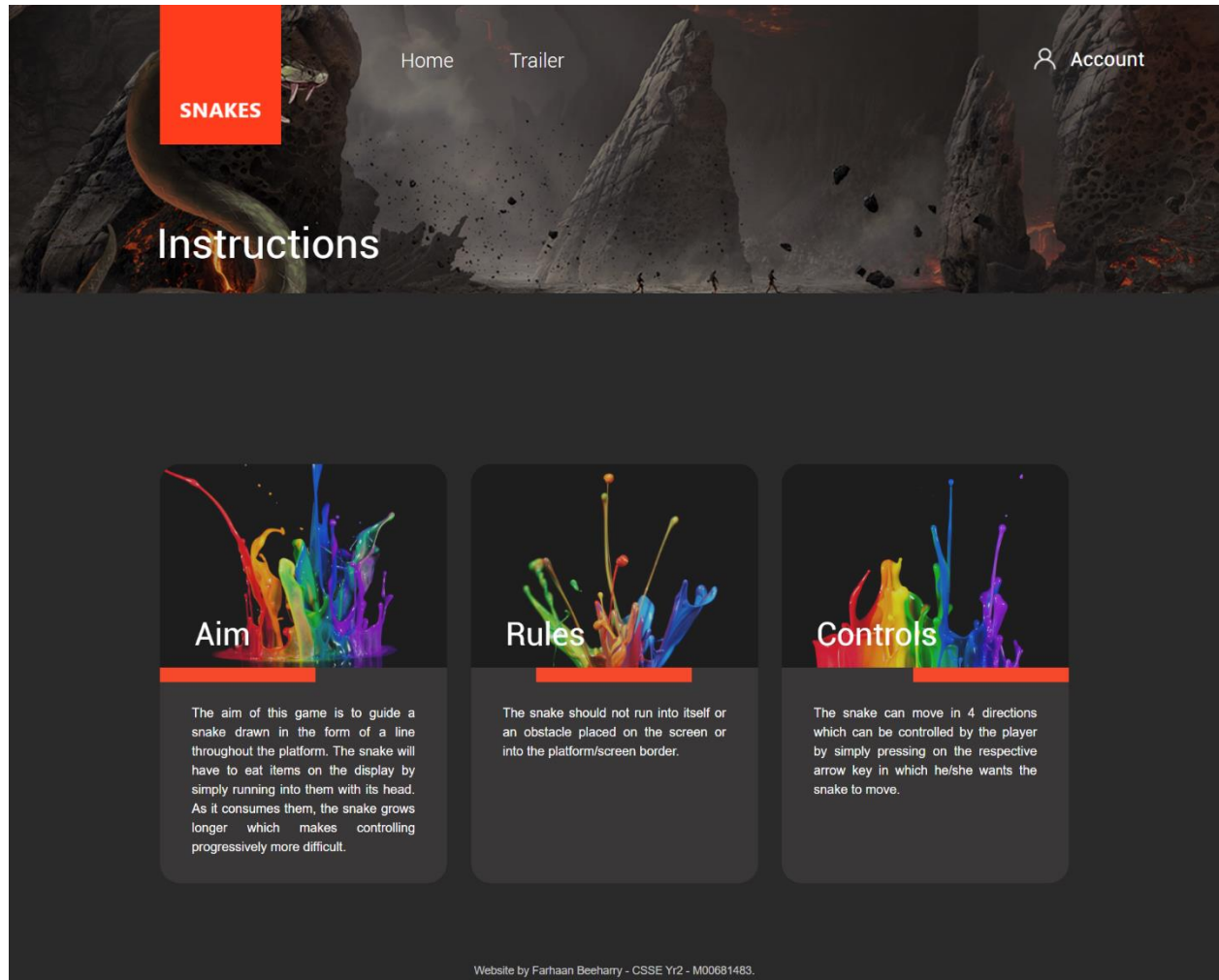
- Leaderboard



On this Leaderboard page, the user will be able to view his/her score and also other scores of other users. This shall heat up the competition between the users.

video: substituted by a short random video. Will be replaced after the game is created.*

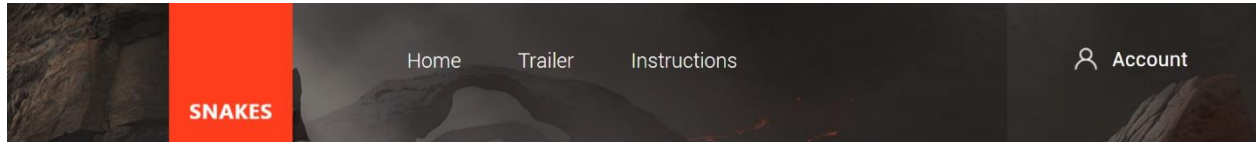
- Instructions



On the Instructions page, the user can read about the aim of the game, the rules and also how to play the game; the controls. If the latter can't still understand the game, he/she can again watch the gameplay video by simply clicking on the Trailer link.

Additional info

- The header navigation bar



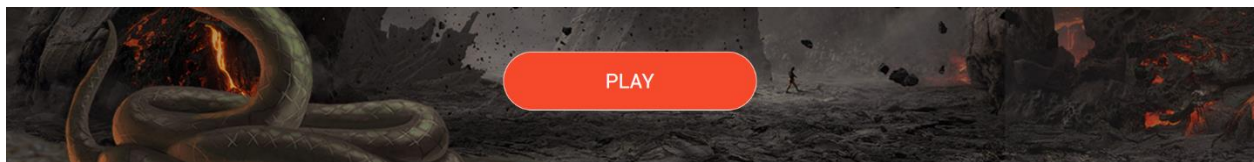
This is the header navigation bar including several links and the account's link. There is also the orange snake logo; **orange** to represent gaming.

- The footer



The footer of the website is simple and light, just to write a few words.

- Play button on hover

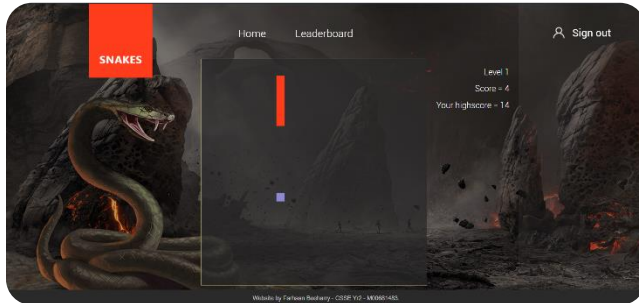


On hovering the cursor over the 'PLAY' button, the button becomes **orange** to let the user know that the latter placed his/her cursor on the button. Again, **orange** to match the background, navigation bar and to represent gaming.

Levels of the game

The game has 8 levels in total. After reaching a certain score, the level is incremented. Each level has different difficulties assigned respectively.

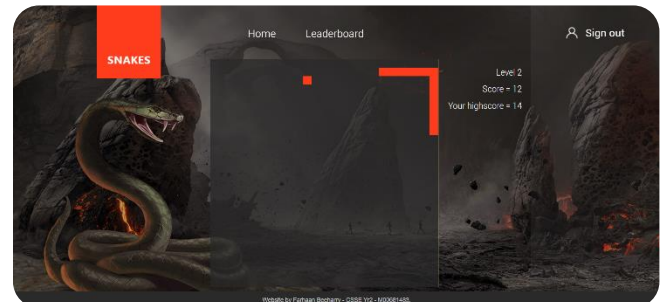
Level 1



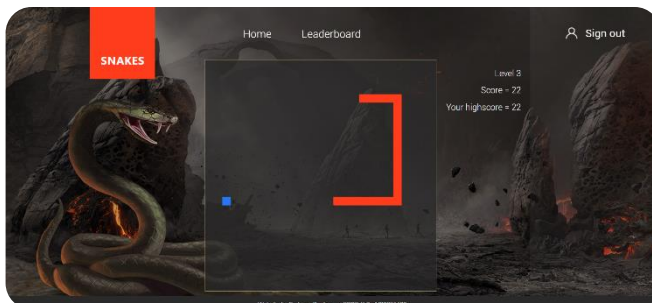
In level 1, the snake moves at a slow speed. And the game has no border. Therefore, if the snake enters the game border from one side, it will come out on the other side.

At a score of 10, the game reaches level 2. During this level, the snake moves at a medium speed and the game still has no border.

Level 2



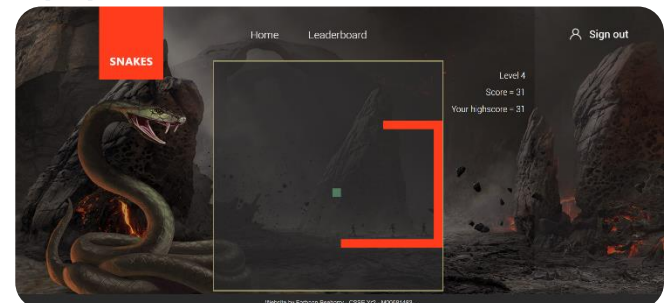
Level 3



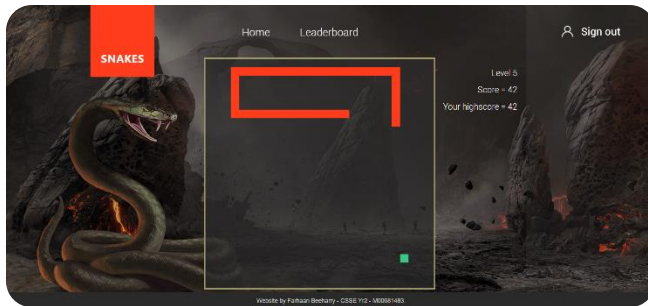
At a score of 20, the game reaches level 3. During this level, the snake moves at a high speed and the game still has no border.

At a score of 30, the game reaches level 4. In this level, the snake slows down to reach a medium speed. And borders appear on the game. This means that if the snake hits the border, it dies.

Level 4



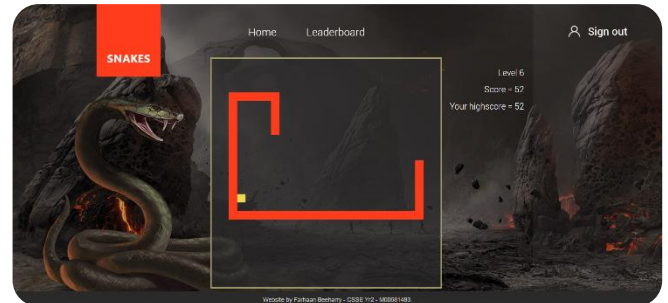
Level 5



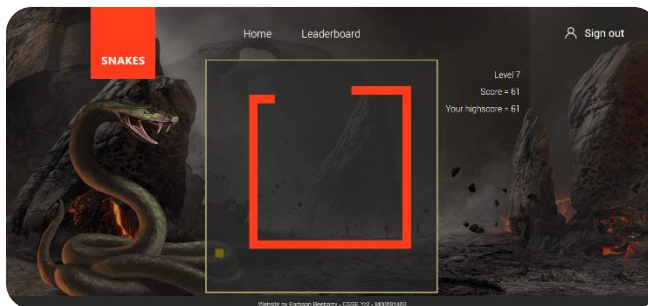
At a score of 40, the game reaches level 5. During this level, the snake moves at a high speed. And the game still has borders.

At a score of 50, the game reaches level 6. During this level, the snake moves at a higher speed than in level 5. And the game still has borders.

Level 6



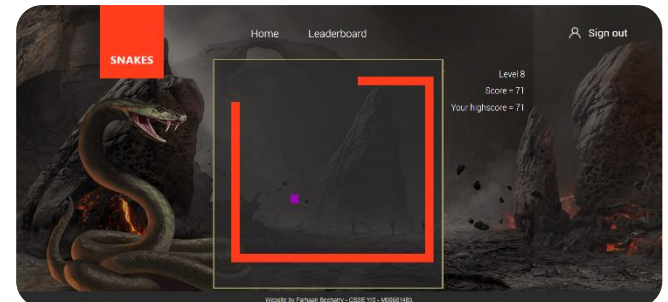
Level 7



At a score of 60, the game reaches level 7. During this level, the snake moves at a higher speed than in level 6. And the game still has borders.

This is the maximum level. At a score of 70, the game reaches level 8. During this level, the snake moves at a higher speed than in level 7. And the game still has borders.

Level 8



The game

Playing the game

The snake is controlled using the arrow keys on the user's keyboard. The aim of the game is to make the snake eat the food and grow longer without dying. After eating each food, the snake gain 1 unit in length.

The food

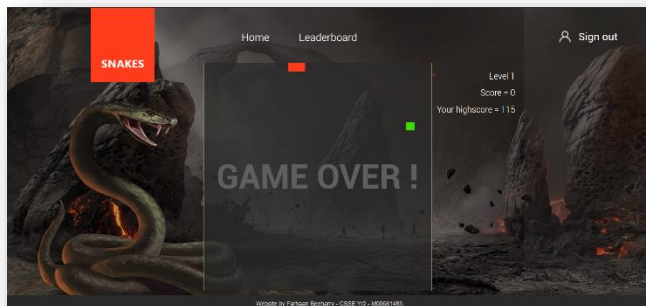
The food is a square unit placed on the board. When the snake eats it, it grows in length. The food is randomly placed on the board. The food will never appear behind the snake. The food keeps showing random colours throughout the game. Only when there is a warning message in the game concerning the next level, the food takes the colour of the game border.

How the snake dies?

During the whole game, the snake dies if its head run against its body. As from level 4, the snake dies if it hits the border of the game.

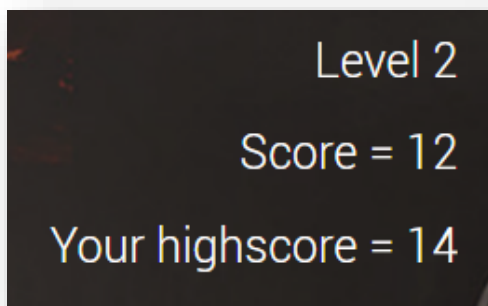
Features of the game

Game Over



When the snake dies, a game over message shows up behind the game canvas to inform the user that his/her snake just died.

Scoreboard



Next to the game canvas, a scoreboard is shown giving details about the level the user is on, the current score of the game and the highest score obtained by the user.

Warning messages



Before each level is changed, the user receives a warning about the next level. Either a message informing the user that the speed of the snake is increasing or that the game will now have borders appears.

Levels changed



At the time a level changes, the user receives a warning about the current change. Either a message saying that the speed of the snake has now been increased or that the game now has borders is shown.

Sound effects

The game has 6 different sound effects namely:

1. When the snake changes direction to up
2. When the snake changes direction to right
3. When the snake changes direction to down
4. When the snake changes direction to left
5. When the snake eats the food
6. When the snake dies

Direction of the snake

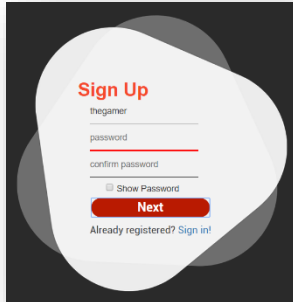
The snake cannot turn on itself. For example, if the snake is moving in the right direction and the user presses the left arrow key, nothing will happen. This is implemented because if the snake turns on itself, it will collide against itself and therefore dies.

The score

For each food that the snake eats, the score increases by one. Which is shown in the scoreboard.

Features of the website

Error in fields

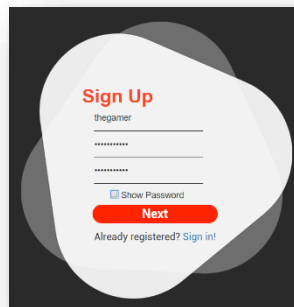


The image shows a 'Sign Up' form on a dark background. The form has a title 'Sign Up' in red. Below it, the username 'thegamer' is entered. The password field is underlined in red, indicating an error. The confirm password field is also underlined in red. There is a 'Show Password' checkbox and a red 'Next' button. At the bottom, it says 'Already registered? Sign in!'.

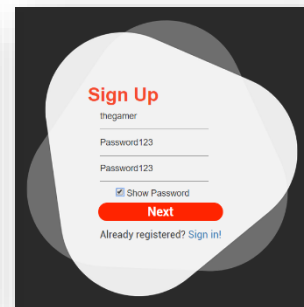
When there is an error in the input fields, the field is underlined in red.

Show password

When the 'show password' checkbox is checked, the user can see the written password.

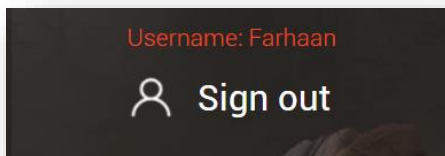


The image shows the 'Sign Up' form with the 'Show Password' checkbox checked. The password field now displays the text 'Password123' instead of masked characters. The 'Next' button is red, and the text 'Already registered? Sign in!' is at the bottom.



The image shows the 'Sign Up' form with the 'Show Password' checkbox checked. The password field now displays the text 'Password123' instead of masked characters. The 'Next' button is red, and the text 'Already registered? Sign in!' is at the bottom.

Signed in – username



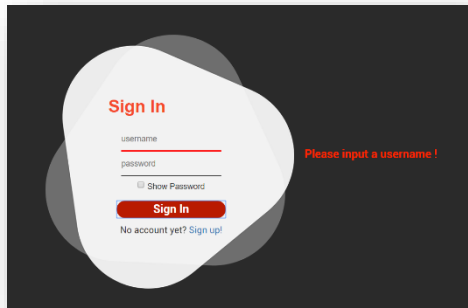
The image shows a dark interface with the text 'Username: Farhaan' in red. Below it, there is a user icon and the text 'Sign out' in white.

When the user is signed in, his/her username appears on the homepage.

Check session & redirect

If the user clicks on the play button, session storage is checked. If the user is logged in, the page goes to the game. Else it redirects to the sign in page. If the user tries to access localhost/play.php, the same verification occurs. If the user is not logged in, he/she will be redirected to the sign in page of the website.

Registration and Login



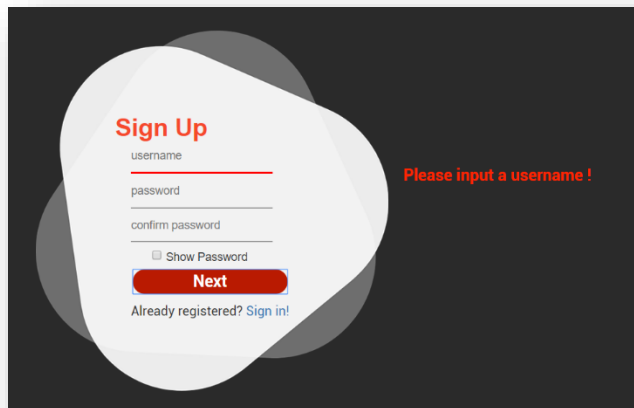
The image shows a 'Sign In' form on a dark background. The form has two input fields: 'username' and 'password'. The 'username' field is empty, and a red error message 'Please input a username !' is displayed to its right. Below the password field is a 'Show Password' checkbox. At the bottom of the form is a red 'Sign In' button. Below the button is a link: 'No account yet? Sign up!'.

In case inputs are not validated, the errors are displayed using html and `<p>` tag.

Registration

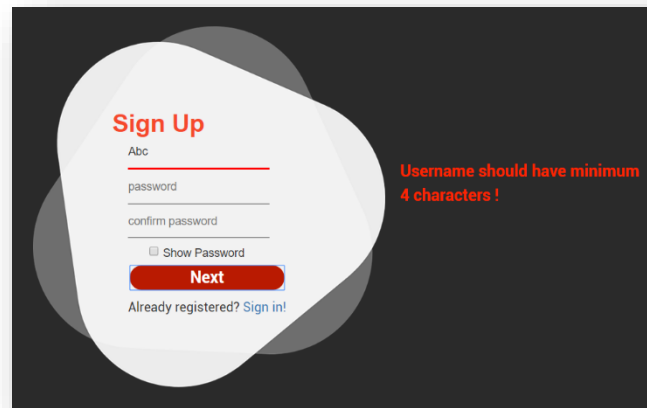
Validation and error handling of the user inputs are as follows:

1. Empty username input



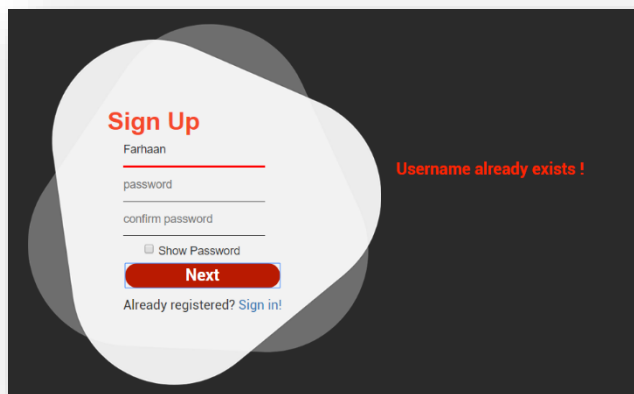
The image shows a 'Sign Up' form on a dark background. The form has three input fields: 'username', 'password', and 'confirm password'. The 'username' field is empty, and a red error message 'Please input a username !' is displayed to its right. Below the password field is a 'Show Password' checkbox. At the bottom of the form is a red 'Next' button. Below the button is a link: 'Already registered? Sign in!'.

2. Username too short



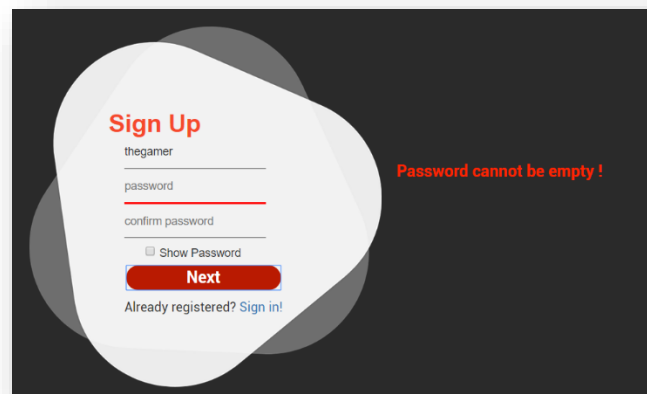
The image shows a 'Sign Up' form on a dark background. The form has three input fields: 'username', 'password', and 'confirm password'. The 'username' field contains the text 'Abc', and a red error message 'Username should have minimum 4 characters !' is displayed to its right. Below the password field is a 'Show Password' checkbox. At the bottom of the form is a red 'Next' button. Below the button is a link: 'Already registered? Sign in!'.

3. Existing username



The image shows a 'Sign Up' form on a dark background. The form has three input fields: 'username', 'password', and 'confirm password'. The 'username' field contains the text 'Farhaan', and a red error message 'Username already exists !' is displayed to its right. Below the password field is a 'Show Password' checkbox. At the bottom of the form is a red 'Next' button. Below the button is a link: 'Already registered? Sign in!'.

4. Empty password



The image shows a 'Sign Up' form on a dark background. The form has three input fields: 'username', 'password', and 'confirm password'. The 'password' field is empty, and a red error message 'Password cannot be empty !' is displayed to its right. Below the password field is a 'Show Password' checkbox. At the bottom of the form is a red 'Next' button. Below the button is a link: 'Already registered? Sign in!'.

5. Weak password

Sign Up

thegamer

abodefg

abodefg

☒ Show Password

Next

Already registered? [Sign in!](#)

Password too weak ! Minimum of 6 characters including numbers, small letters and caps letters.

6. Empty confirm password field

Sign Up

thegamer

Password123

confirm password

☒ Show Password

Next

Already registered? [Sign in!](#)

Enter a password to confirm !

7. Password not matching

Sign Up

thegamer

Password123

Password

☒ Show Password

Next

Already registered? [Sign in!](#)

Passwords do not match !

8. Empty date of birth

Sign Up

☒ Male ☐ Female

DOB: dd/mm/yyyy

email

phone number

Sign Up

Please enter a birthdate !

9. Future date

Sign Up

☒ Male ☐ Female

DOB: 26/12/2021

email

phone number

Sign Up

Year cannot be in the future !

10. Minimum age not matched

Sign Up

☒ Male ☐ Female

DOB: 26/12/2015

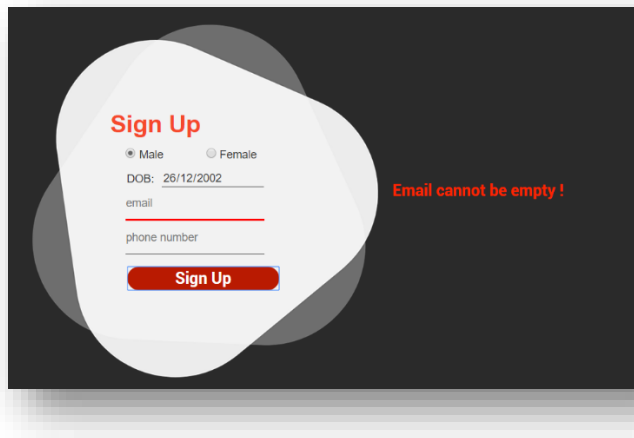
email

phone number

Sign Up

Minimum age not matched !

11. Empty email



Sign Up

☒ Male ☐ Female

DOB: 26/12/2002

email

phone number

Sign Up

Email cannot be empty !

12. Invalid email format



Sign Up

☒ Male ☐ Female

DOB: 26/12/2002

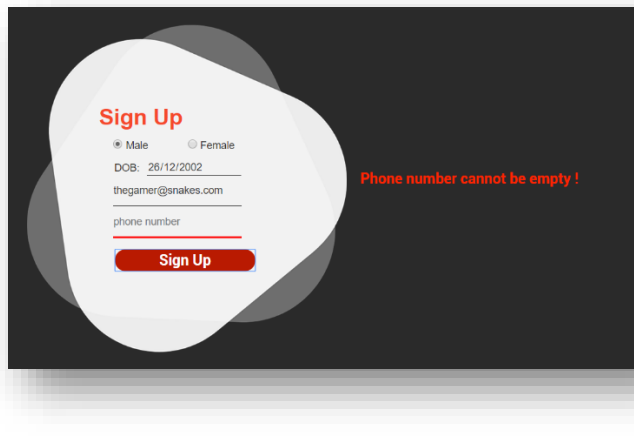
123456

phone number

Sign Up

Invalid email format !

13. Empty phone number



Sign Up

☒ Male ☐ Female

DOB: 26/12/2002

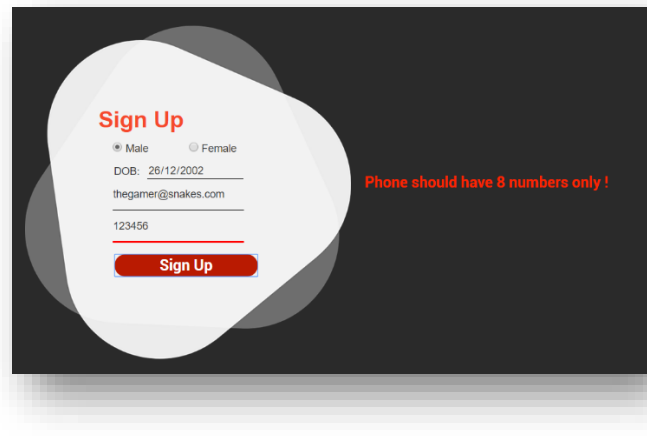
thegamer@snakes.com

phone number

Sign Up

Phone number cannot be empty !

14. Invalid phone number format



Sign Up

☒ Male ☐ Female

DOB: 26/12/2002

thegamer@snakes.com

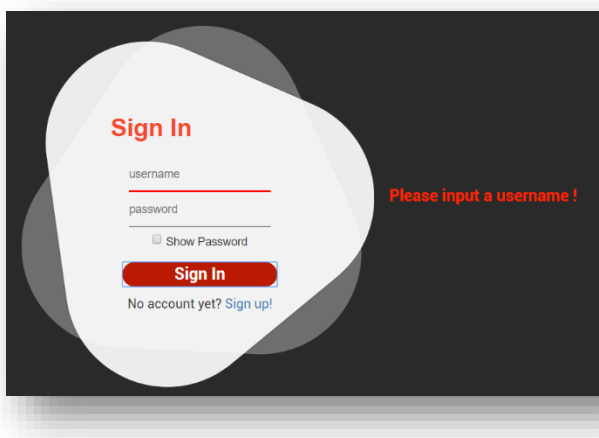
123456

Sign Up

Phone should have 8 numbers only !

Sign in

1. Empty username



Sign In

username

password

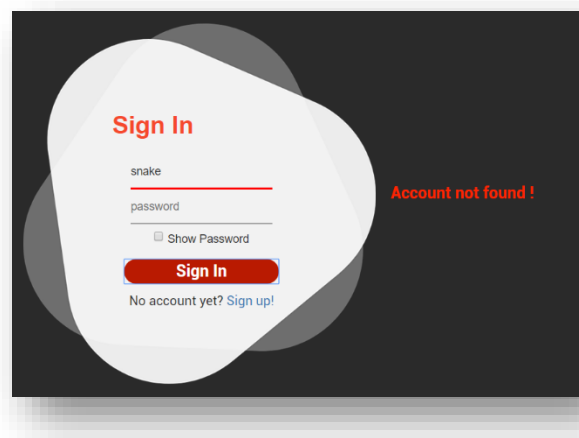
☐ Show Password

Sign In

No account yet? [Sign up!](#)

Please input a username !

2. No account with this username



Sign In

snake

password

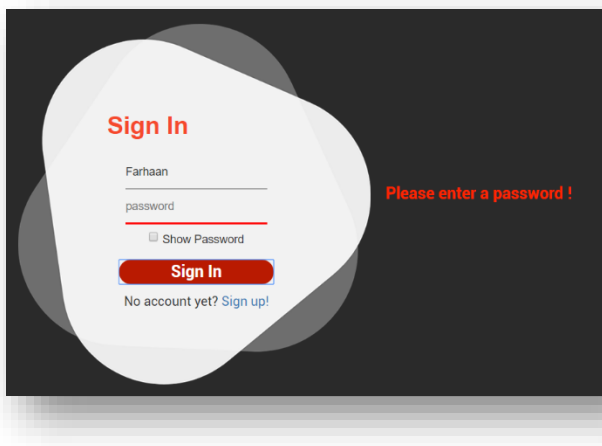
☐ Show Password

Sign In

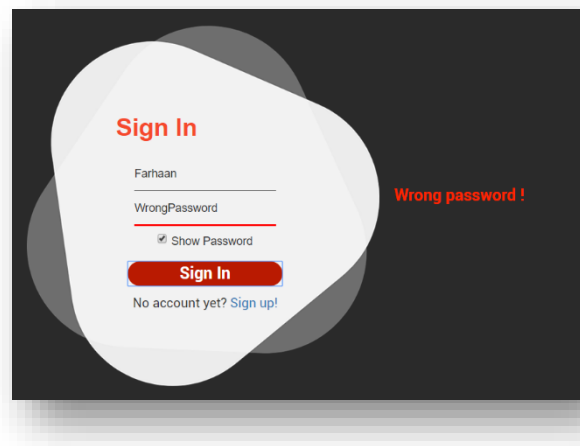
No account yet? [Sign up!](#)

Account not found !

3. Empty password



4. Wrong password



The leaderboard

The leaderboard is a table which shows the rankings of the users. It displays the scores in descending order using bubble sort (the highest score at the top). The table has 3 columns; the rank, the username and the score.

The logic behind the leaderboard is as follows:

1. An empty array is created
2. A for loop is used to read the keys of each of the users in the local storage
3. The keys are used to get the data of the corresponding users in the local storage
4. The data is parsed and saved into the array created in step 1
5. Bubble sorting is used to sort the score in descending order so that the highest score is at the top
6. A for loop is used to create rows in the table for each user
7. Html tag is used to display the table.

A screenshot of a web application's leaderboard page. The page has a dark background with a large, dark, rocky landscape image. In the top left corner, there is a red square with the word "SNAKES" in white. In the top right corner, there are links for "Home", "Instructions", and "Sign out" (with a user icon). The word "Leaderboard" is displayed in large white text. Below it, there is a table with three columns: "Rank", "Username", and "Score". The table contains six rows of data. At the bottom, there is a small text: "Website by Farhaan Beeharry - CSSE Y12 - M00681483."

| Rank | Username | Score |
|------|----------|-------|
| 1 | Farhaan | 115 |
| 2 | Yusuf311 | 46 |
| 3 | Nameera | 31 |
| 4 | warrenLS | 29 |
| 5 | sk3090 | 14 |
| 6 | thegamer | 0 |