

Development of Hit The Mouse Games Using Javascript

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Abstract

The idea of this game is that this game includes arcade games that are played traditionally which can be found in night markets or shopping centers such as Plazas. Arcade games are games that aren't focused on a story and can be entertaining when you're bored. This is done to analyze the needs that will be used to design and make a mole game, starting with determining the theme, game title, and programming language used to develop the game. The tools used include hardware and software. the application can run according to what has been designed by the author. The researcher tested the application by playing several times with different IP addresses as a test material for the application, whether the test was successful or not. Based on the results of making a game application for hitting moles, there are several conclusions that researchers can give, namely: a. This game can involve the player's concentration and become cognitive therapy, because the rats come out one by one from the ground to be hit. b. This game can only be played by one person. c. The making of the game Mole Hit has worked well according to the design that was made and compiled at the beginning of the game design, using the Javascript programming language.

Keywords: Game Arcade; Javascript; Android

author guideline; economy, sustainability, social

Introduction

Hit The Mouse is one of the fun and challenging games. The player has to click or tap on the mice that appear randomly from the holes on the screen. The main objective of the game is to achieve the highest score by hitting as many mice as possible in the allotted time.

Literature Review

Definition of Games

The word game comes from English. The meaning of the word "Game" in the Indonesian dictionary is a game. The game in this case refers to the idea of intellectual playability (Intellectual Playability Game), which can also be seen as an arrangement for participants to make decisions and take action, usually in a lighthearted or refreshing way (Krisdiawan et al., 2020).

JavaScript

JavaScript is a web programming language that is Client Side Programming Language. Client Side Programming Language is a type of programming language published by clients. The application client in question refers to web browsers such as Google, Chrome and Mozilla Firefox. The Client Side programming language is different from Server Side programming languages such as PHP, where for the server side all program code is executed on the server side. To run JavaScript, we only need a text editor application and a web browser. JavaScript has features: high-level programming language, client-side, loosely typed and object-oriented (Andre, 2014; Megida, 2021).

JQuery

JQuery is a Javascript based framework. JQuery is the same as the Javascript Library, which is a collection of ready-to-use Javascript code or functions that make it easier and faster for us to create JavaScript code. JQuery is a Javascript library created to make it easy to build websites with HTML running on the client side. (Heru Sulistiono, 2018, p.4)

First developed by John Resig in 2006. Since then Query has grown into an open source project and has become the most popular JavaScript library in the world. The official jQuery website is located at Jquery.com. Modular character JavaScript libraries support the development of dynamic web pages with various features and web-based applications (web apps) (Andre, 2014).

Codeigniter

According to Heru Sulistiono (Sulistiono Heru, 2018), the notion of Codeigniter is an open source application in the form of a framework or framework for building websites using the PHP programming language. Its purpose is to support project development faster than code base or structured code, by providing many of the libraries commonly used in development. The simple interface and logic for accessing this library makes CodeIgniter easy to use and learn. CodeIgniter was written or created by Ellis Lab and was first released on February 28, 2006.

On July 9, 2013, (Vidal-Silva et al., 2020) Ellis Lab announced that they were looking for a new owner for CodeIgniter, citing a lack of resources to give the framework

the attention they felt it deserved. On October 6, 2014, Ellis Lab announced that Codeigniter would continue development under the management of the British Columbia Institute of Technology, with the latest stable version being version 3.1.6 which was released on September 25, 2017 (Sulistiono Heru, 2018).

MySQL

In its development, MySQL is also called SQL which stands for Structured Query Language. SQL is a structured language specifically used to process databases. SQL was first defined by the American National Standards Institute (ANSI) in 1986. MySQL is an open source database management system (Palla et al., 2012).

MySQL is a relational database management system. That is, the data managed in the database is placed in several separate tables so that the data will be much faster. MySQL can be used to manage databases ranging from small to very large (SiteGround, 2021).

SQL can also be interpreted as a standard interface for relational management systems, including systems that operate on personal computers. SQL allows the user to know where it is, or how the information is organized. SQL is easier to use than programming languages, but more complex than spreadsheets and data processing software. A simple SQL statement can generate a single set of query information stored on different computers in scattered locations, which requires a lot of time and computational resources. SQLite can be used for interactive investigations, or the creation of ad hoc reports or embedded in application programs.

Methods

Stages of research is a process that is carried out in a structured, logical and systematic way. The following are the stages of the research.



Figure 1. Stages Research

1. Problem Analysis

This stage is carried out to analyze the needs that will be used to design and create a game to beat the mole, starting with determining the theme, game title, and programming language used to develop the game. The tools used include hardware and software.

2. Data Collect

To obtain and collect data in the preparation of this thesis, researchers obtained data through the website to look for theories related to making arcade-type games.

3. Design

At this stage the researcher starts designing the game to be built where at this stage the researcher first designs the game to be made with the data that has been arranged so that the stages of the process are arranged properly.

4. Coding

At this stage the researcher begins to build applications according to the flowchart that has been made.

5. Testing

At this stage application testing is useful to find out whether the application is successful or not.

6. Maintenance

At this stage the researcher makes improvements if the application or game made has an error during testing. If repairs have been made, the application will be tested again.

Design

The design of this game application uses the UML (Unified Modeling Language) modeling language.

1. Use Case Diagram

The use case describes the type of interaction between the system user and the system. The following is a use case diagram that has been designed.

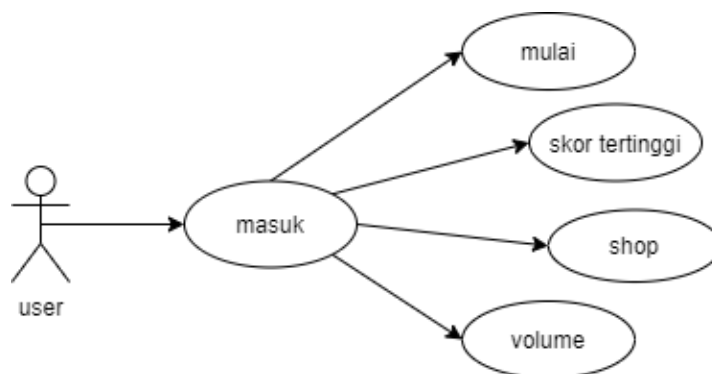


Figure 2. Use Case Diagram

Description of the image above is:

- 1) Login : requires the user to enter a name first before starting to play. So that data can be stored.
- 2) Menu: on the menu there are four options, namely start, highest score, shop and volume. In this menu the user can see lives and points.
 - a. Life: used when the user wants to play, when the user enters a name then can enter the main page, the user will immediately be given three hearts of life.
 - b. Points: used when buying lives. Points are earned when the user reaches the score set by the system or the user can win the game or can be said to exceed the score set by the system. One point equals five scores.
- 3) Start : when the user will start playing the game.
- 4) Highest score: users can see the names or usernames of the 10 highest scores in the game.

- 5) *Shop*: users can buy lives if lives run out while being played and want to play again.
- 6) *Volume*: the user can adjust the sound, such as turning off or turning on the sound in the game.

2. Class Diagram

Class diagram is a diagram that is used to display classes in the form of packages to meet one of the package requirements that will be used later (Perwitasari et al., 2023).

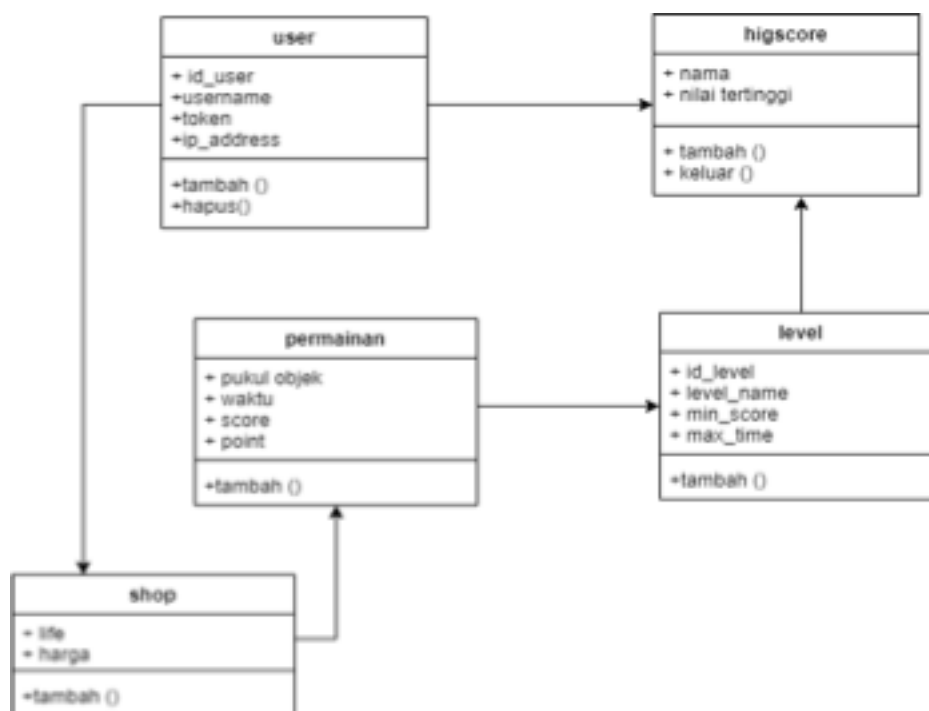


Figure 3. Class Diagram

3. Activity Diagram

Activity diagram sequence of the process of running a system and depicted vertically (Hendrawan et al., 2023).

Activity Diagram of "Start" Menu

Users must enter a name before playing in order to enter the main menu page. When the user has entered a name, the user can enter the main menu page. If the user has logged in, then the next game the user no longer needs to log in. Users can directly enter the main menu page.

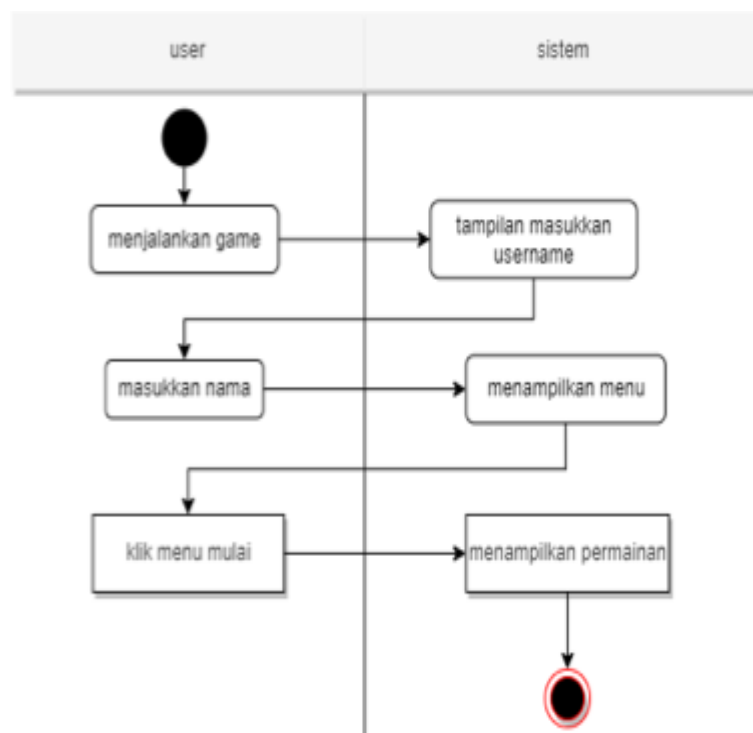


Figure 4. Activity Diagram of "Start" Menu

Activity Diagram of "Highest Scores" Menu

Users can see the 10 highest scores that have ever been played and users can see the scores of other players who have played in this application..

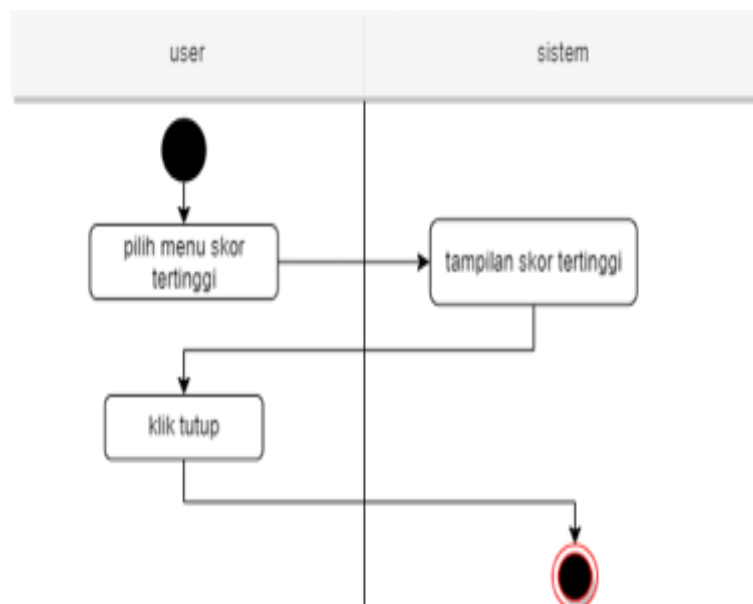


Figure 5. Activity Diagram of "Highest Scores" Menu

Activity Diagram of “Shop” Menu

Users can buy lives if they run out while playing.



Figure 6. Activity Diagram of “Shop” Menu

Activity Diagram of “Voice” Menu

The user can choose whether to use sound or not, if the user wants to turn off the sound then there will be no song and sound when hitting the mouse while playing.

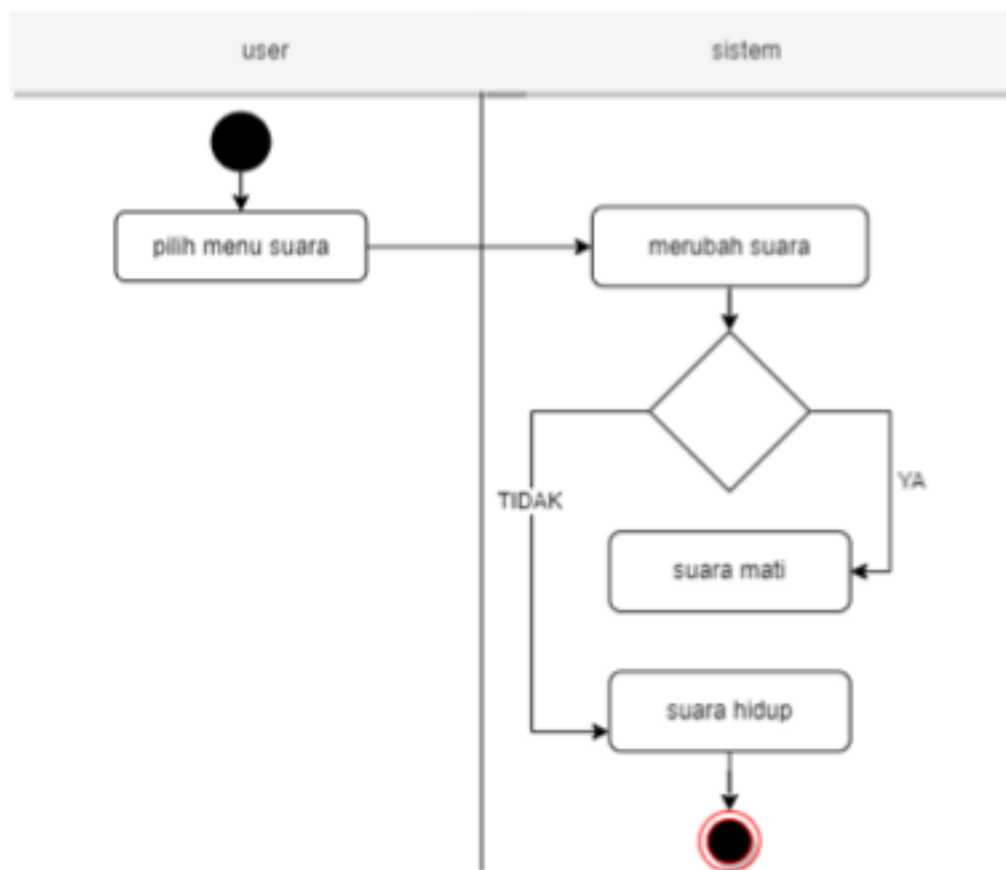


Figure 7. Activity Diagram of “Voice” Menu

4. Sequence Diagram

A sequence diagram is also called a sequence diagram, which is a diagram used to explain and display the interactions between objects in a system in detail.

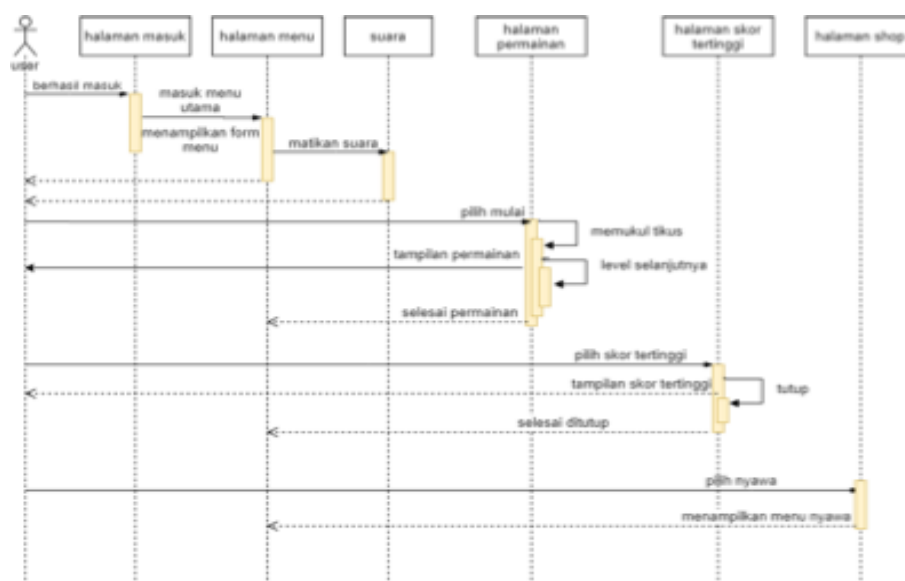


Figure 8. Sequence Diagram

Based on the picture above, when the user opens the application, the display that comes out is the display of entering the username. This username is entered so that user data can be stored in the database in the form of a token. If the user has filled in the name in the username, a "success" sign will appear, then the menu display will immediately appear.

In the menu display, there are four buttons namely Start, Highscore, Shop, and Sound. If the user selects the sound button, then there is no sound at all (mute). The sound button is also still in the menu display.

If the user presses the start button, it will display the display of the game to be played. The user has to hit the mouse that comes out of the hole. To be able to continue to the next level, the user must meet the conditions set by the game. To be able to advance to level two, the user must get a score of fifteen within one minute. Then if the game has started then the user must hit the mouse that comes out of the hole until the time is up, if the time is up then the game will exit itself and display the menu page. The user can see the score of the 10 highest scores, when finished viewing the score, the user can return to the menu page. The share button is to share the link of this game application. If the user wants to tell friends about this game, then the user can share the link. Users can only share the link through an application called WhatsApp.

Database Design

Database design is the process of determining the content and arrangement of data required for various system designs. The goal is to fulfill information that contains specific user needs and their applications. The following is a database design of the game Hitting the Mouse.

1. Table of Level

Table Name : tt_level

#	Nama	Jenis	Penyortiran	Atribut	Tak Ternilai	Bawaan	Komentar	Ekstra
1	id_level	int(11)			Tidak	Tidak ada		AUTO_INCREMENT
2	level_name	varchar(50)	latin1_swedish_ci		Tidak	Tidak ada		
3	min_score	int(11)			Tidak	Tidak ada		
4	max_time	int(11)			Tidak	Tidak ada		
5	speed	int(11)			Tidak	Tidak ada		

Figure 9. Table of Level

2. Table of *Product*

Table Name: tt_product

#	Nama	Jenis	Penyortiran	Atribut	Tak Ternilai	Bawaan	Komentar	Ekstra
1	id_product	int(11)			Tidak	Tidak ada		AUTO_INCREMENT
2	product_name	varchar(250)	latin1_swedish_ci		Tidak	Tidak ada		
3	product_price	int(11)			Tidak	Tidak ada		
4	get_heart	int(11)			Tidak	Tidak ada		

Figure 10. Table of *Product*

3. Table of *Score*

Table Name: tt_score

#	Nama	Jenis	Penyortiran	Atribut	Tak Ternilai	Bawaan	Komentar	Ekstra
1	id_score	int(11)			Tidak	Tidak ada		AUTO_INCREMENT
2	user	int(11)			Tidak	Tidak ada		
3	score	int(11)			Tidak	Tidak ada		
4	level	int(11)			Ya	NULL		

Figure 11. Table of *Score*

4. Table of *Score History*

Table Name: tt_score_history

#	Nama	Jenis	Penyortiran	Atribut	Tak Ternilai	Bawaan	Komentar	Ekstra
1	id_score_history	int(11)			Tidak	Tidak ada		AUTO_INCREMENT
2	user	int(11)			Tidak	Tidak ada		
3	min_life	int(11)			Tidak	Tidak ada		
4	score	int(11)			Tidak	Tidak ada		
5	level	int(11)			Tidak	Tidak ada		
6	point	int(11)			Ya	NULL		
7	created_time	datetime			Tidak	current_timestamp()		

Figure 12. Table of *Score History*

5. Table of *Shop History*

Table Name: tt_shop_history

#	Nama	Jenis	Penyortiran	Atribut	Tak Ternilai	Bawaan	Komentar	Ekstra
1	id_shop	int(11)			Tidak	Tidak ada		AUTO_INCREMENT
2	product	int(11)			Tidak	Tidak ada		
3	user	int(11)			Tidak	Tidak ada		
4	get_life	int(11)			Tidak	Tidak ada		
5	price	int(11)			Tidak	Tidak ada		
6	created_time	datetime			Tidak	current_timestamp()		

Figure 13. Table of *Shope History*

6. Table of User

Table Name : tt_user

#	Nama	Jenis	Penyortiran	Atribut	Tak Terimal	Bawaan	Komentar	Ekstra
1	id_user	int(11)			Tidak	Tidak ada		AUTO_INCREMENT
2	username	varchar(50)	latin1_swedish_ci		Tidak	Tidak ada		
3	life	int(11)			Tidak	3		
4	point	int(11)			Tidak	0		
5	token	varchar(250)	latin1_swedish_ci		Ya	NULL		
6	ip_address	varchar(50)	latin1_swedish_ci		Tidak	Tidak ada		
7	created_time	datetime			Tidak	current_timestamp()		

Figure 14. Table of User

Results

The results of the interface design will be explained in this section, how the program that has been designed looks like. The interface is created on a mobile basis and must require internet or online.

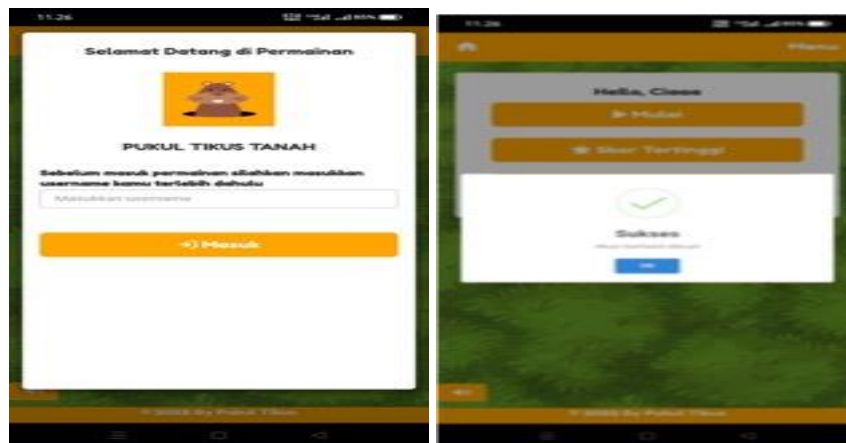


Figure 15. (a) Login Page; (b) Successfully Enter Username

Before playing you are required to fill in a name in the form, enter a username, this is useful to know the username and IP address which functions as whether this user has logged in before or not. If not, a page will appear like Figure 15.a.

When the user has successfully entered a name, then a successful page will appear as shown in Figure 15.b.

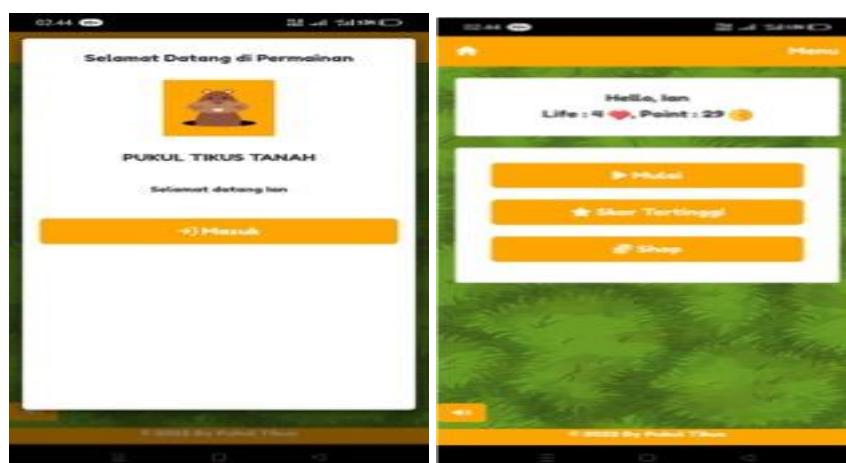


Figure 16. (a) Initial display when logged in; (b) Main Menu

If the user has previously entered a username, there is no need to enter a name again, the system will immediately display the Welcome to the Game page, then instruct the user to enter the menu page as shown in Figure 16.a.

In Figure 16.b, the user can choose which button to display. On this page, the sound of music is still alive because the volume icon still has waves and the color of the icon is still white.

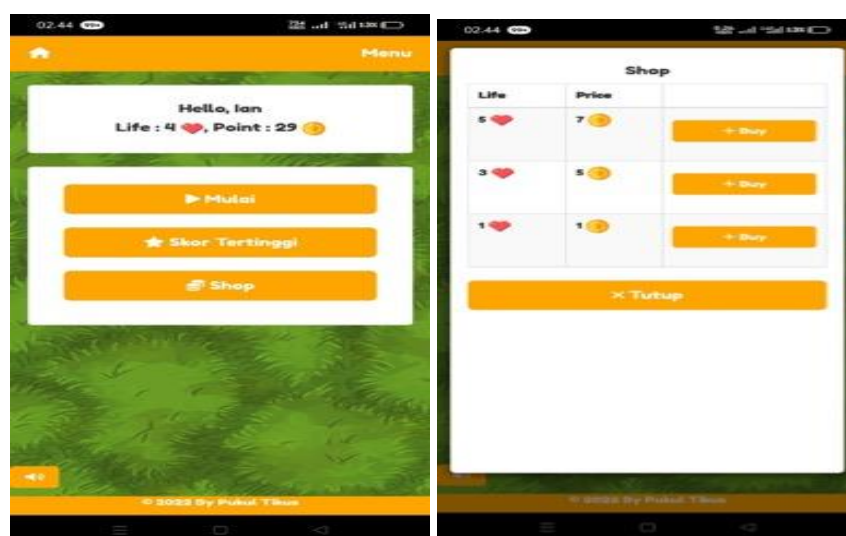


Figure 17. (a) Turn off the Sound; (b) Purchase of Lives

Figure 17.a, on this page it is the same as the previous image, it is still on the menu page, it's just that in the volume section you can see the icon turning black and marked with an x, this can mean that the user has turned off the sound in the game. Figure 17.b, on this page users can buy lives if the points can meet the conditions for buying lives.

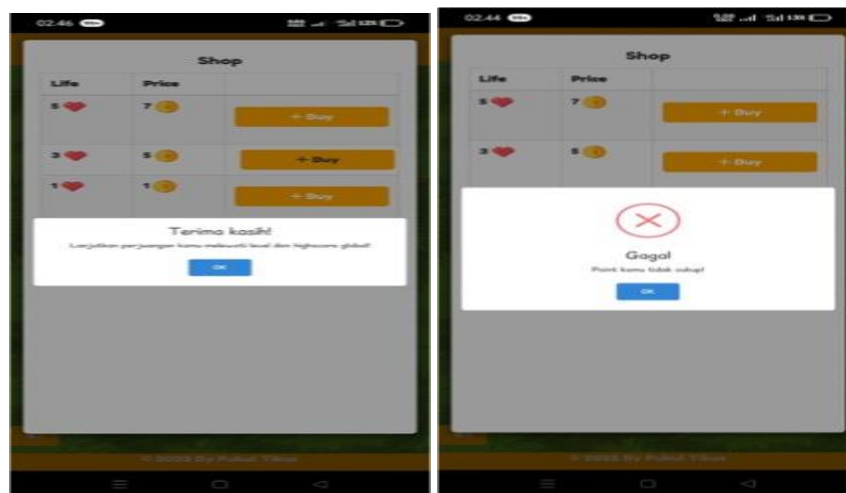


Figure 18. (a) Successfully Buying Lives; (b) Failure to Buy Lives

Figure 18.a shows the page if the user wants to buy a life and the points that the user has meet the conditions for buying a life, the purchase transaction is successful. And Figure 18.b shows the appearance of a user who wants to buy a life, but the points the user has do not meet the requirements for buying a life, so the purchase transaction fails.



Figure 19. (a) Play before being hit; (b) Play After Hit

At the start of the game, the user is given one second to hit as many mice as possible, at a minimum to continue to the next level the user must hit 15 mice in 1 minute. Figure 19.a shows the appearance of a mouse that has not been beaten. And picture 19.b shows a rat after being hit in the head, and there are injuries to the rat's face.

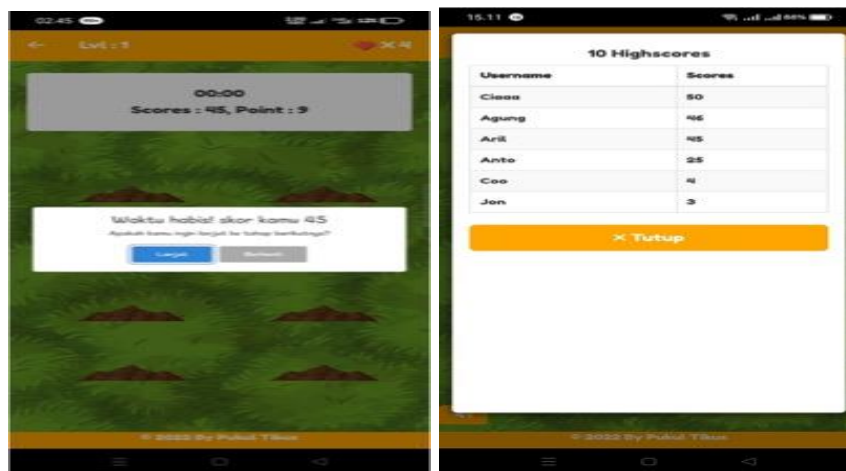


Figure 20. (a) Game to the Next Level; (b) Highest Score

Figure 20.a is a display that shows if the user wants to continue to the next level or not, otherwise the user will be returned to the menu page. And in figure 20.b, on this page, the user sees the 10 highest scores.

Discussion

This mole rat game was developed using the JavaScript programming language, which is a very popular language for web development. JavaScript allows developers to dynamically manipulate HTML and CSS elements, thereby making game interactions more engaging.

In developing this game, we used JavaScript to control the appearance of mice and holes on the screen, manage game logic such as calculating scores and time, and control the behavior of mice that appear and disappear. We also make use of JavaScript features such as event handling to handle user interaction with the game.

In addition, we use CSS to design the appearance of the game to make it more attractive and responsive. We've also made use of the HTML5 audio element to add fun sound effects to the game.

Conclusion

In this article, we have introduced the development of a simple mole rat game using JavaScript. Android game development using JavaScript provides advantages in terms of accessibility, portability, and strong interactive capabilities. With a good understanding of JavaScript and other development techniques, developers can create engaging and entertaining games for internet users to enjoy on a variety of devices.

With the ever-expanding capabilities and evolution of Android technology, there is a lot of potential to develop more complex and engaging games in the future. The development of a mole rat game is just a simple example of the many types of games that can be developed using JavaScript and the latest mobile technologies.

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