Task 1
SDD, BRAIN BEAT

Arav Zad, Brain Beat

The Problem

- Kids and Teenagers are addicted to violent gaming. The Outcomes are children who lack of basic time management skills, have aggressive thoughts, and get lower grades which severely affects their future.
- Adults and the Elderly take stress on a daily basis, ultimately affecting their mental and physical health.

The Solution

Study of Scientific Research shows that Games like Brain Beat allow for the following-

- Improves Cognitive Skills
- Boosts Attention and Focus
- Enhances Visual Recognition
- Improves Short Term Memory
- Promotes Critical Thinking
- Stress Relief
- Prevents / Delays Dementia

Did you notice anything common?
These are all Positive Impacts by a Singular Game, yet there is only 1 of a kind in the Market, which is the "Simon" game.
So, why not create a game that allows for all of these improvements, but better?...

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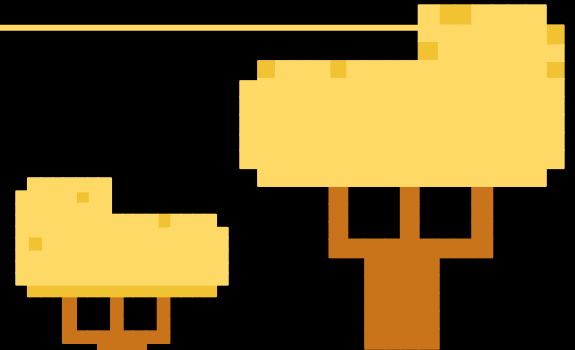
What, How, Why

SDD Details

Data Types, Structures and Control Structures

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Annotations of Screen Design GUI, Choice of Controls

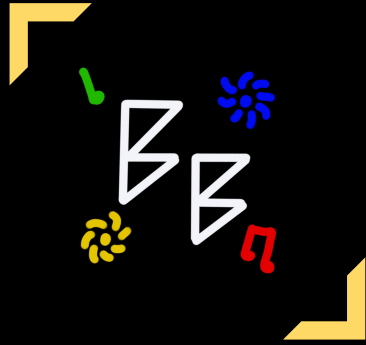## Conclusion

Concluding Statement

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Brain Beat

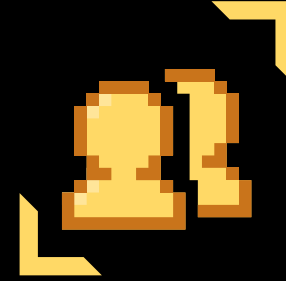Project Idea, What it is and How to Play it, Target Audience

WHAT & HOW TO PLAY

What is it?

Brain Beat is a Short Term Memory Game which improves cognitive thinking. The Game is fun, addictive in a good way, and deems as a good challenge for those of all ages.

How to Play?

The Game randomly generates patterns based on selected Game Mode (for difficulty) and outputs that pattern step by step through auditory and visual gestures. The Game only proceeds to work if the Player responds back and attempts to follow the pattern correctly (on/regardless of time - G.M). By having a "High Score" Counter, the game can be played socially as a friendly challenge.

Target Audience

	EDUCATION MODE	NORMAL MODE	CHALLENGE MODE
What?	Cognitive and Instruction Based for Schooling Purposes. No Time Limit in Gameplay Looks more 'kiddish', with "Kid Modules" (Animals, Col..)	For Casual Gameplay. Linear Time Limit. (Consistent) Standard RGBY	For Intense Gameplay. Exponentially Decreasing Time Limit. (After every Sequence, smaller) Flashy/Distracting
Benefits	Teachers can use as an educational tool for fine motor skills and quick thinking activity.	Can be used to de-stress and relax, OR to warm up the brain for other activities.	Socially Captivating, Brag about High Score, Skill Based Game
Age Group	5 -12	Adults and Elderly	Teens, Young Adults

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THE SIMON MEMORY GAME

What is it, and how is this similar to Brain Beat?
What is unique in Brain Beat from Simon?

WHAT AND HOW TO PLAY

What is it?

Explores Pattern Repetition and was the first game to really explore the cognitive interconnections between the 3 main senses - Auditory, Tactile, and Visual

THE SIMON MEMORY GAME

SIMON

Simon also wanted to solve the Problem of mainly Adults taking Stress, and to reduce all kinds of harmful addictions, as mentioned in Wikipedia.

WHAT'S DIFFERENT?

Although Brain Beat has taken heavy Inspiration from "Simon", it does NOT copy it's exact form and style of Gameplay. For Example, this is how the typical "Simon" Game Looks. By taking and adapting it's concept to craft an Education Mode with Animals and their Sounds, or on the other end of the spectrum a Challenge Mode, which includes the time between each tile play shorter and shorter, with flashy, distracting lights. The Normal Mode is the most similar and retains it's originalities of the "Simon" Game.
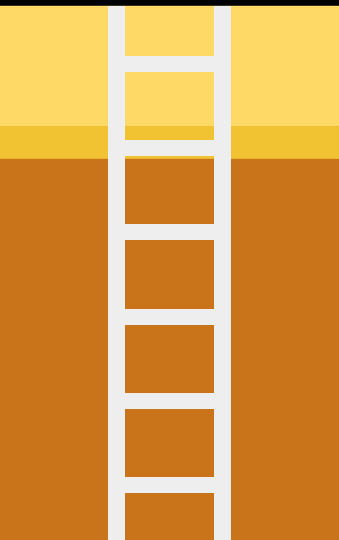
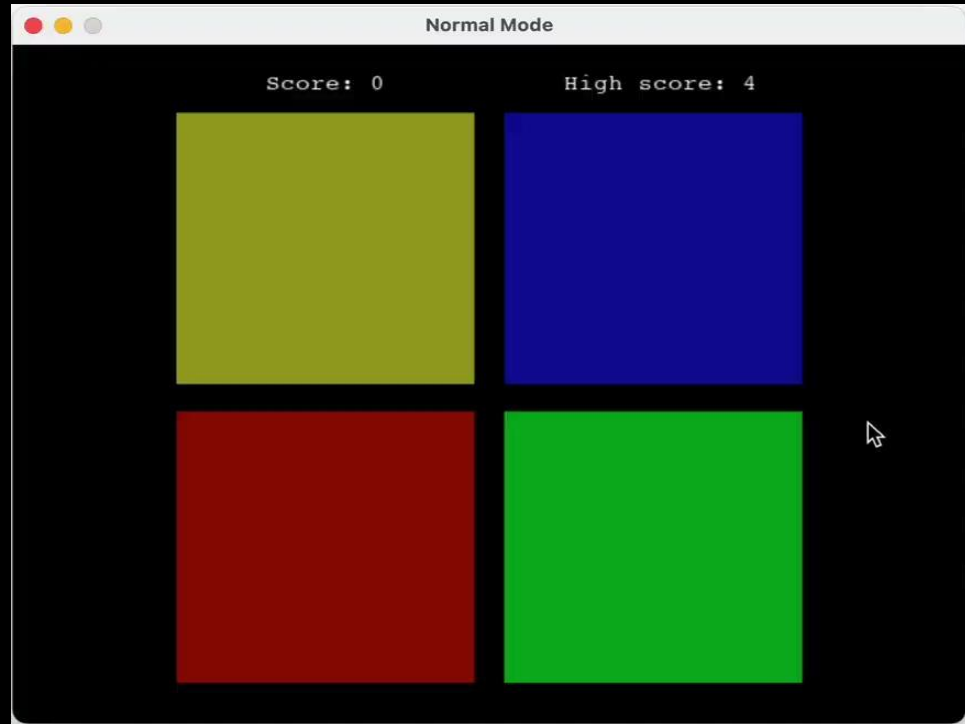Instead of Beeps of Colours, there will be noises of Animals, for E.g, Oink, Moo, Sss, Roar

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SDD Details

Data Types, Data Structures, Control Structures

QUICK VIDEO AS TO HOW THE DETAILS OF THE GAME LOOK

Sneak Peak of Normal Mode!

Data Structures

ARRAY (CompSet)

This array is for the Computer to store each sequential pattern of correct colours into its respective index of order. This is given by the 'import random' code. E.g. –

ARRAY (PlayerSet)

As seen in the video, the Player's Array would look like this e.g..
This does NOT look the same as the Absolute CompSet, therefore, Game Over

Colour	Red	Green	Blue
Index	1	2	3

Colour	Red	Green	Yellow
Index	1	2	3

DATA TYPES - Integers

Field Name	Data Type	Explanation
Score	Integer	Increment Score after each Sequence is correctly completed by Player
SequenceLength	Integer	If Correct Sequence from before, add 1 to the length of sequence
Time	Integer	For NormMode and ChallMode, player must respond within certain amt of seconds

DATA TYPES - Boolean

Field Name	Data Type	Explanation
CheckPlayerInput	Boolean	Sequence Correct, "True", Input Incorrect, "False"
IsPlayersTurn	Boolean	Whether it's currently the player's turn to repeat the sequence or the game's turn to display the sequence
PauseOrPlay	Boolean	To check if Game is in Motion or not

DATA TYPES - String

| Field Name	Data Type	Explanation
Colour	String	"Red", "Blue", …
ScoreDisp	String	"Score: 5"
HighScoreDisp	String	"High Score: 11"
GameOverDisp	String	"Game Over!"

CONTROL STRUCTURES: Pre-test

Pre-Test Loop

The Program uses a Pre-test Loop to keep the Game 'going'. While the Player's input matches the computer generated sequence, it then performs a series of alterations within the loop. For Example, for a Section of Code, this will be it's Pre-test Iteration Scheme.

```
BEGIN SubRoutine

    WHILE Player's Sequence = Comp Sequence:
        Add random Colour to Comp Sequence
    ENDWHILE
    Display "GAME OVER"

END SubRoutine
```
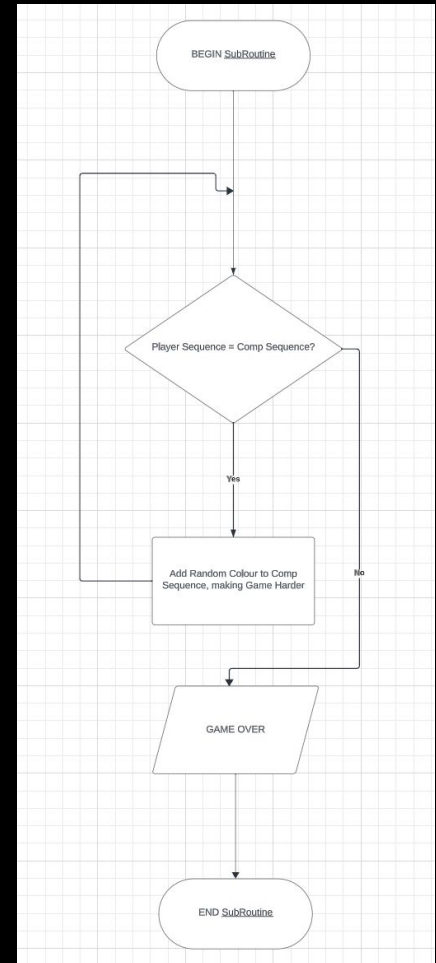
CONTROL STRUCTURES: Multiway S

Multiway Selection

Multiway Selection is displayed in all modes when the Player clicks on 1 of 4 images, it should play a specific sound and perform a specific animation of that image. For any Section of Code, this is running in:

```
BEGIN SubRoutine

    CASEWHERE Button clicked is

        A: Play "A.mp3" and perform "A.animation"
        B: Play "B.mp3" and perform "B.animation"
        C: Play "C.mp3" and perform "C.animation"
        D: Play "D.mp3" and perform "D.animation"

        Otherwise:
            IF GameMode is NormMode OR ChallMode AND No Buttons clicked:
                Check Time

    ENDCASE

END SubRoutine
```
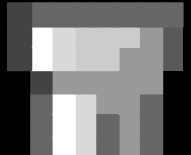
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SCREEN DESIGN

Annotation of Screen Designs, Justification of Controls

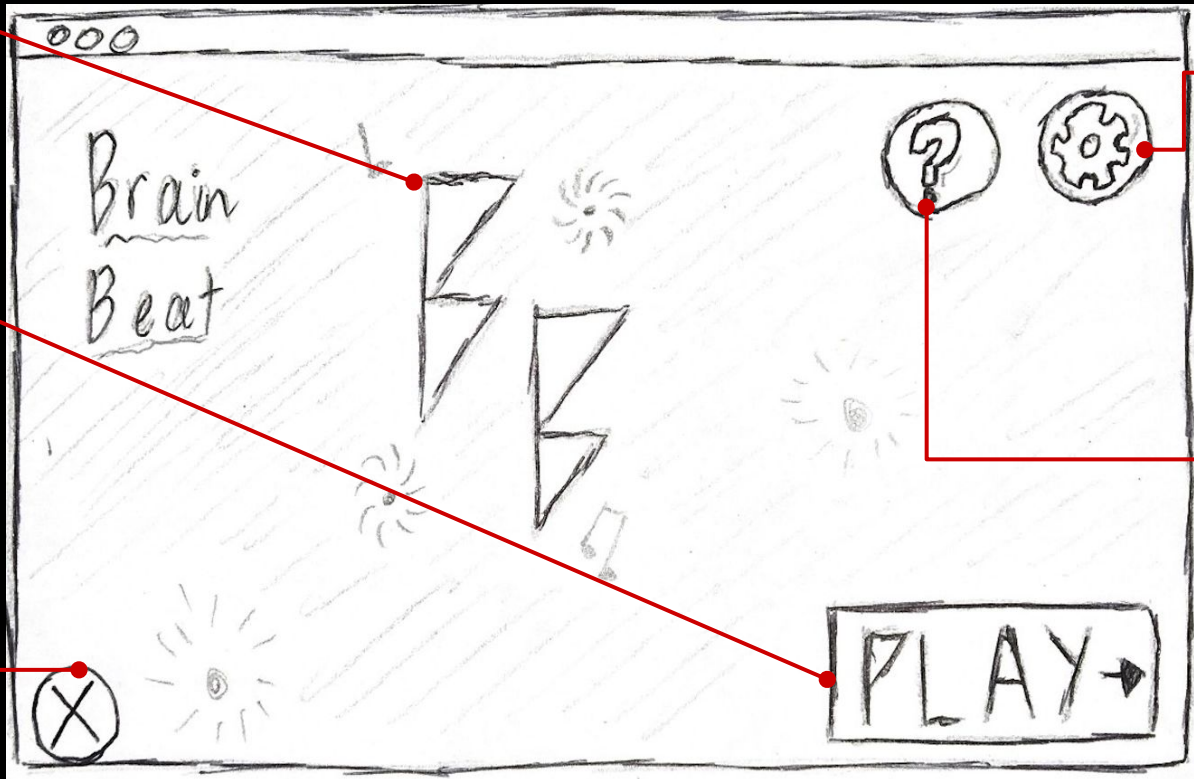# ⊨ UI DESIGN 1 (HomeScren) ⊨

Brain Beat Logo

Captivating, with Normal Mode Theme

PLAY BUTTON

Proceeds to terminate Current Window, then open SelectGameMode

**QUIT APPLICATION**

Allows for easy access to exit the App

Settings

For User Friendly handling, options such as: Clear High Score, Sound and SFX Volume, etc...

How To Play

Saved on a Text File which will appear as a Pop Up once clicked so that Players are informed of Brain Beat's purpose and function as a game

UI DESIGN 2 (SelectGameMode)

Home Screen

For the User to go "Back" to the Home Screen and view other Options, E.g. (Settings, HTP)
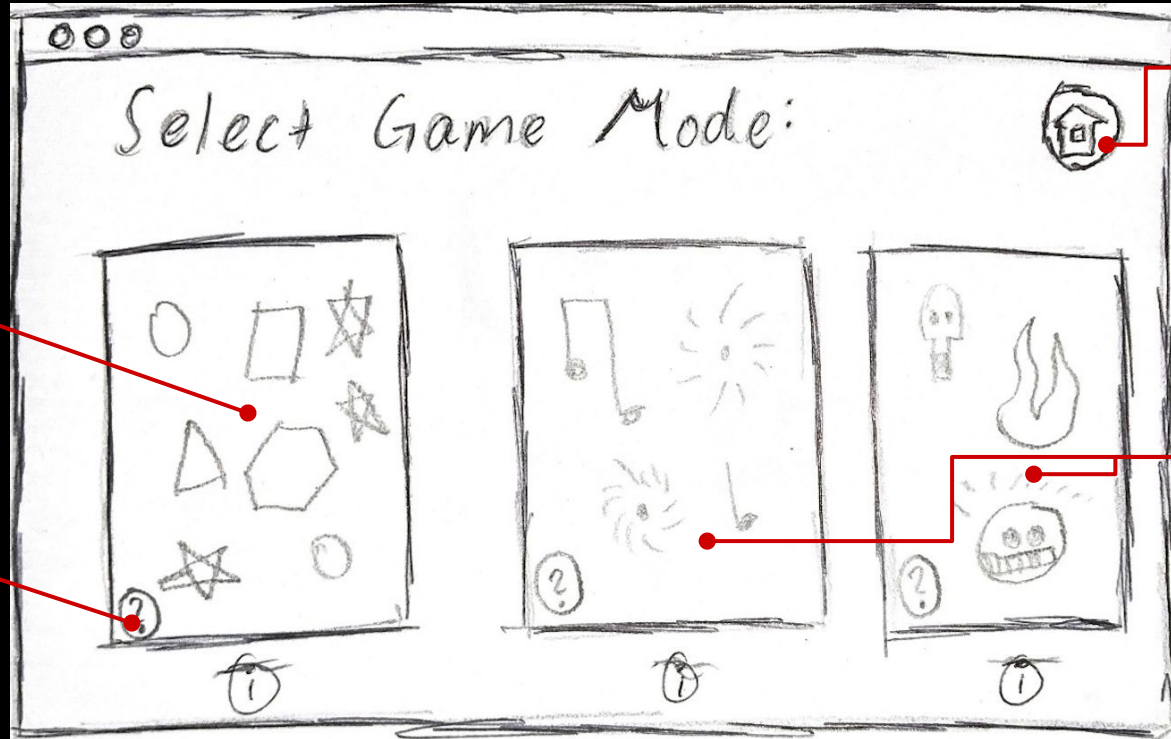
EduMode Thumbnail

Colourful Shapes represent the Edu Mode Module

Hover for More

Once User Hovers over, gets more of a Description as to WHAT each Mode is (Target Audience explained)

Modes

Middle is Normal Mode, whilst last represents Challenge Mode with Skulls and Fire

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CONCLUSION

Concluding Statement

WHY SHOULD YOU PLAY?

WHY, WHY, WHY?

- Improves Memory Skills
- Fun and Engaging
- For **_ALL_** Age Groups
- Socially Healthy Competition