

Documentación del Juego de Memoria

Descripción General

Este proyecto implementa un juego de memoria con emojis que soporta tres modos de juego diferentes:

- Jugador vs Jugador
- Jugador vs Máquina
- Máquina vs Máquina

El juego está implementado en Python y utiliza una arquitectura basada en clases con dos archivos principales:

- `main.py`: Punto de entrada del programa
- `engine.py`: Contiene la lógica principal del juego

Estructura del Código

Clase Engine

La clase principal que maneja toda la lógica del juego.

Atributos Principales

- `emoji`: Diccionario que almacena los emojis disponibles
- `emojiMix`: Lista de emojis mezclados para el tablero actual
- `finalizado`: Estado de finalización del juego
- `player1`, `player2`: Control de turnos
- `anchoTablero`, `altoTablero`: Dimensiones del tablero
- `posicionesAcertadas`: Lista de posiciones ya encontradas
- `scorePlayer1`, `scorePlayer2`: Puntuaciones
- `gameMode`: Modo de juego seleccionado
- `machineDifficult`: Nivel de dificultad de la máquina
- `machineMemory`: Memoria de la máquina para modos inteligentes

Métodos Principales

1. `menu()` y `difficulty_menu()`
 - o Muestran las opciones de juego y dificultad
 - o Permiten la selección del modo de juego y nivel de dificultad
2. `data_table()`

- Inicializa el tablero de juego
 - Valida las dimensiones introducidas
 - Asegura que el área del tablero sea par
3. `start()`
- Método principal que controla el flujo del juego
 - Maneja los turnos y la lógica de cada modo de juego
 - Implementa las diferentes estrategias de la máquina
4. `get_valid_guess()`
- Obtiene y valida las jugadas de jugadores y máquinas
 - Implementa la inteligencia artificial en diferentes niveles:
 - ☐ Nivel 1 (Fácil): Selección aleatoria
 - ☐ Nivel 2 (Medio): Memoria temporal
 - ☐ Nivel 3 (Difícil): Memoria completa
5. `paint_table()` y `show_guess()`
- Manejan la visualización del tablero
 - Muestran las cartas descubiertas y ocultas

Características Avanzadas

Inteligencia Artificial

El juego implementa tres niveles de IA:

- 6. **Fácil:** Selecciones completamente aleatorias
- 7. **Medio:** Memoria temporal que recuerda jugadas previas
- 8. **Difícil:** Memoria completa del tablero

Validación de Entrada

- Comprueba dimensiones máximas (5x6)
- Asegura área par para parejas válidas
- Previene selección de posiciones ya descubiertas

Esquemas de Prueba

Prueba 1: Creación del Tablero

```
=====Welcome to Memory=====
=====Menu=====
```

Choose the game mode

1. Play - Player 1 vs Player 2
2. Play - Player vs Machine
3. Play - Machine 1 vs Machine 2
4. Exit

Select a option(1-4): 1

=====GAME STARTS=====

=====PLAYER VS PLAYER=====

Please, enter the board size in the format 'width x height'. Example: 5x6
The maximum allowed size is 5x6
4x4

=====Player 1 TURN=====

□	□	□	□
□	□	□	□
□	□	□	□
□	□	□	□

Prueba 2: Modo Jugador vs Jugador

=====Welcome to Memory=====

=====Menu=====

Choose the game mode

1. Play - Player 1 vs Player 2
2. Play - Player vs Machine
3. Play - Machine 1 vs Machine 2
4. Exit

Select a option(1-4): 1

=====GAME STARTS=====

=====PLAYER VS PLAYER=====

Please, enter the board size in the format 'width x height'. Example: 5x6
The maximum allowed size is 5x6
3x2

=====Player 1 TURN=====

□ □ □
□ □ □

=====Player 1 - 1º GUESS=====

Enter the answer in 'width x height' format (e.g., 3x3):
1x1

🍌 □ □
□ □ □

=====Player 1 - 2º GUESS=====

Enter the answer in 'width x height' format (e.g., 3x3):
3x2

🍌 □ □
□ □ 🍌

***+ NOT MATCH ***

=====Player 2 TURN=====

□ □ □
□ □ □

=====Player 2 - 1º GUESS=====

Enter the answer in 'width x height' format (e.g., 3x3):
2x2

□ □ □
□ 🍌 □

=====Player 2 - 2º GUESS=====

Enter the answer in 'width x height' format (e.g., 3x3):
3x1

□ □ 🍌
□ 🍌 □

*** MATCH FOUND ***

□ □ 🍌
□ 🍌 □

=====Player 2 TURN=====

□ □ 🍌
□ 🍌 □

=====Player 2 - 1º GUESS=====

Enter the answer in 'width x height' format (e.g., 3x3):

2x1



=====Player 2 - 2º GUESS=====

Enter the answer in 'width x height' format (e.g., 3x3):

1x1



*** MATCH FOUND ***



=====Player 2 TURN=====



=====Player 2 - 1º GUESS=====

Enter the answer in 'width x height' format (e.g., 3x3):

1x2



=====Player 2 - 2º GUESS=====

Enter the answer in 'width x height' format (e.g., 3x3):

3x2



*** MATCH FOUND ***



=====GAME IS OVER=====

Results are:

Player 1: has matched 0 pairs - Total Score: 0

Player 2: has matched 3 pairs - Total Score: 6

=====WINNER=====

Player 2 WINS

Player 2 TOTAL SCORE: 6

Prueba 3: Modo Jugador vs Máquina

//Prueba 3 - Modo Jugador vs Máquina Super Inteligente

=====Welcome to Memory=====

=====Menu=====

Choose the game mode

1. Play - Player 1 vs Player 2
2. Play - Player vs Machine
3. Play - Machine 1 vs Machine 2
4. Exit

Select a option(1-4): 2

=====GAME STARTS=====

=====PLAYER VS PLAYER=====

Please, enter the board size in the format 'width x height'. Example: 5x6

The maximum allowed size is 5x6

2x3

=====Difficulty Menu=====

Choose machine difficulty

1. Easy
2. Medium
3. Hard
4. Exit

Select a option(1-3): 3

=====Player 1 TURN=====

☐ ☐
☐ ☐
☐ ☐

=====Player 1 - 1º GUESS=====

Enter the answer in 'width x height' format (e.g., 3x3):

1x1

	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>

=====Player 1 - 2º GUESS=====

Enter the answer in 'width x height' format (e.g., 3x3):

2x2

	<input type="checkbox"/>
<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>


***+ NOT MATCH ***

=====Super Inteligen Machine TURN=====

<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>



=====Super Inteligen Machine - 1º GUESS=====

	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>


Super Inteligen Machine has select: 

=====Super Inteligen Machine - 2º GUESS=====

	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	

Super Inteligen Machine has select the pairs:  and 

*** MATCH FOUND ***



	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	

=====Super Inteligen Machine TURN=====

	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>


□ 

=====Super Inteligen Machine - 1º GUESS=====



 

□ □

□ 

Super Inteligen Machine has select: 

=====Super Inteligen Machine - 2º GUESS=====

 □

□ 

Super Inteligen Machine has select the pairs:  and 


*** MATCH FOUND ***

 □

□ 



=====Super Inteligen Machine TURN=====

 □


□ 

=====Super Inteligen Machine - 1º GUESS=====


 


□ 



Super Inteligen Machine has select: 

=====Super Inteligen Machine - 2º GUESS=====

Super Inteligen Machine has select the pairs:  and 

*** MATCH FOUND ***



=====GAME IS OVER=====

Results are:

Player 1: has matched 0 pairs - Total Score: 0

Machine: has matched 3 pairs - Total Score: 6

=====WINNER=====

Machine WINS

Machine TOTAL SCORE: 6

Prueba 4: Modo Máquina vs Máquina

=====Welcome to Memory=====

=====Menu=====

Choose the game mode

1. Play - Player 1 vs Player 2
2. Play - Player vs Machine
3. Play - Machine 1 vs Machine 2
4. Exit

Select a option(1-4): 3

=====GAME STARTS=====

=====PLAYER VS PLAYER=====

Please, enter the board size in the format 'width x height'. Example: 5x6


The maximum allowed size is 5x6

3x2

=====Machine 1 TURN=====

☐ ☐ ☐
☐ ☐ ☐

=====Machine 1 - 1º GUESS=====

☐ ☐ ☐
☐ ☐ 

Machine 1 has select: 🍓

=====Machine 1 - 2º GUESS=====

Cannot select the same position twice, please choose again.

=====Machine 1 - 2º GUESS=====

🍌 ☐ ☐
☐ ☐ 🍓

Machine 1 has select the pairs: 🍓 and 🍌

***+ NOT MATCH ***

=====Machine 2 TURN=====

☐ ☐ ☐
☐ ☐ ☐

=====Machine 2 - 1º GUESS=====

☐ ☐ ☐
☐ 🍌 ☐

Machine 2 has select: 🍌

=====Machine 2 - 2º GUESS=====

☐ 🍓 ☐
☐ 🍌 ☐

Machine 2 has select the pairs: 🍌 and 🍓

***+ NOT MATCH ***

=====Machine 1 TURN=====

☐ ☐ ☐
☐ ☐ ☐


=====Machine 1 - 1º GUESS=====


☐ ☐ ☐
🍌 ☐ ☐

Machine 1 has select: 🍌

=====Machine 1 - 2º GUESS=====

☐ ☐ ☐

□ □ 


Machine 1 has select the pairs: □ and 


***+ NOT MATCH ***

=====Machine 2 TURN=====


□ □ □
□ □ □


=====Machine 2 - 1º GUESS=====

□ □ □
□ □ 

Machine 2 has select: 

=====Machine 2 - 2º GUESS=====

□ □ □
□ □ 

Machine 2 has select the pairs:  and □

***+ NOT MATCH ***

=====Machine 1 TURN=====

□ □ □
□ □ □

=====Machine 1 - 1º GUESS=====

□ □ □
□ □ □

Machine 1 has select: □

=====Machine 1 - 2º GUESS=====

□ □ □
□ □ □

Machine 1 has select the pairs: □ and □

*** MATCH FOUND ***

□ □ □
□ □ □


=====Machine 1 TURN=====


☐ ☐ ☐
☐ ☐ ☐

=====Machine 1 - 1º GUESS=====

=====Machine 1 - 1º GUESS=====

=====Machine 1 - 1º GUESS=====

☐ ☐ ☐
☐ ☐ 



Machine 1 has select: 

=====Machine 1 - 2º GUESS=====

Cannot select the same position twice, please choose again.

=====Machine 1 - 2º GUESS=====

 ☐ ☐
☐ ☐ 


Machine 1 has select the pairs:  and 


***+ NOT MATCH ***

=====Machine 2 TURN=====

☐ ☐ ☐
☐ ☐ ☐



=====Machine 2 - 1º GUESS=====

 ☐ ☐
☐ ☐ ☐

Machine 2 has select: 

=====Machine 2 - 2º GUESS=====

 ☐ ☐
☐  ☐

Machine 2 has select the pairs:  and 

*** MATCH FOUND ***



=====Machine 2 TURN=====



=====Machine 2 - 1º GUESS=====

=====Machine 2 - 1º GUESS=====

=====Machine 2 - 1º GUESS=====

=====Machine 2 - 1º GUESS=====

=====Machine 2 - 1º GUESS=====



Machine 2 has select: 🍓

=====Machine 2 - 2º GUESS=====

=====Machine 2 - 2º GUESS=====



Machine 2 has select the pairs: 🍓 and 🍓

*** MATCH FOUND ***



=====GAME IS OVER=====

Results are:

Machine 1: has matched 1 pairs - Total Score: 2

=====WINNER=====

Machine 2 TOTAL SCORE: 4

=====Welcome to Memory=====

```
=====Menu=====
```

1. Play - Player 1 vs Player 2
2. Play - Player vs Machine
3. Play - Machine 1 vs Machine 2
4. Exit

```
=====GAME STARTS=====
=====PLAYER VS PLAYER=====
```

The maximum allowed size is 5x6. Please enter values within this range.
5-6

```
Invalid format. Please use 'width x height' (e.g., 3x3).
5 6
```

=====Player 1 TURN=====

=====Player 1 - 1º GUESS=====

Enter the answer in 'width x height' format (e.g., 3x3):

Prueba 6: Niveles de Dificultad - Fácil

=====Welcome to Memory=====

=====Menu=====

Choose the game mode

1. Play - Player 1 vs Player 2
2. Play - Player vs Machine
3. Play - Machine 1 vs Machine 2
4. Exit

Select a option(1-4): 2

=====GAME STARTS=====

=====PLAYER VS PLAYER=====

Please, enter the board size in the format 'width x height'. Example: 5x6

The maximum allowed size is 5x6

2x3

=====Difficulty Menu=====

Choose machine difficulty

1. Easy
2. Medium
3. Hard
4. Exit

Select a option(1-3): 1

=====Player 1 TURN=====

☐ ☐
☐ ☐
☐ ☐

=====Player 1 - 1º GUESS=====

Enter the answer in 'width x height' format (e.g., 3x3):

1x1

 ☐
☐ ☐
☐ ☐

=====Player 1 - 2º GUESS=====

Enter the answer in 'width x height' format (e.g., 3x3):

2x2

 ☐
☐ 
☐ ☐


***+ NOT MATCH ***

=====Machine TURN=====

☐ ☐
☐ ☐
☐ ☐



=====Machine - 1º GUESS=====

☐ ☐
☐ 
☐ ☐

Machine has select: 

=====Machine - 2º GUESS=====

☐ ☐
☐ 
 ☐

Machine has select the pairs:  and 

***+ NOT MATCH ***

=====Player 1 TURN=====

☐ ☐
☐ ☐
☐ ☐

=====Player 1 - 1º GUESS=====

Enter the answer in 'width x height' format (e.g., 3x3):



2x3

☐ ☐
☐ ☐
☐ 


=====Player 1 - 2º GUESS=====

Enter the answer in 'width x height' format (e.g., 3x3):

1x1

 ☐
☐ ☐
☐ 

*** MATCH FOUND ***

 ☐
☐ ☐
☐ 

=====Player 1 TURN=====

 ☐
☐ ☐
☐ 

=====Player 1 - 1º GUESS=====

Enter the answer in 'width x height' format (e.g., 3x3):

2x1

 
☐ ☐
☐ 

=====Player 1 - 2º GUESS=====

Enter the answer in 'width x height' format (e.g., 3x3):

2x2

 
☐ 
☐ 

***+ NOT MATCH ***

=====Machine TURN=====

 ☐
☐ ☐
☐ 

=====Machine - 1º GUESS=====

 
☐ ☐
☐ 

Machine has select: 🍒

=====Machine - 2º GUESS=====

🍒 🍒
🍒 □
□ 🍒

Machine has select the pairs: 🍒 and 🍒

***+ NOT MATCH ***

=====Player 1 TURN=====

🍒 □
□ □
□ 🍒

=====Player 1 - 1º GUESS=====

Enter the answer in 'width x height' format (e.g., 3x3):

2x1

🍒 🍒
□ □
□ 🍒

=====Player 1 - 2º GUESS=====

Enter the answer in 'width x height' format (e.g., 3x3):

1x3

🍒 🍒
□ □
🍒 🍒

*** MATCH FOUND ***

🍒 🍒
□ □
🍒 🍒

=====Player 1 TURN=====


🍒 🍒
□ □
🍒 🍒


=====Player 1 - 1º GUESS=====

Enter the answer in 'width x height' format (e.g., 3x3):


2x2

```


=====Player 1 - 2º GUESS=====

Enter the answer in 'width x height' format (e.g., 3x3):
1x2


*** MATCH FOUND ***



=====GAME IS OVER=====

Results are:

Player 1: has matched 3 pairs - Total Score: 6
Machine: has matched 0 pairs - Total Score: 0

=====WINNER=====

Player 1 WINS

Player 1 TOTAL SCORE: 6

```

Prueba 6: Niveles de Dificultad - Intermedio

```

=====Welcome to Memory=====

=====Menu=====

Choose the game mode

1. Play - Player 1 vs Player 2
2. Play - Player vs Machine
3. Play - Machine 1 vs Machine 2
4. Exit

Select a option(1-4): 2

```

=====GAME STARTS=====

=====PLAYER VS PLAYER=====

Please, enter the board size in the format 'width x height'. Example: 5x6

The maximum allowed size is 5x6

2x3

=====Difficulty Menu=====

Choose machine difficulty

1. Easy

2. Medium

3. Hard

4. Exit

Select a option(1-3): 2

=====Player 1 TURN=====

☐ ☐

☐ ☐

☐ ☐

=====Player 1 - 1º GUESS=====

Enter the answer in 'width x height' format (e.g., 3x3):

1x1

 ☐

☐ ☐

☐ ☐

=====Player 1 - 2º GUESS=====

Enter the answer in 'width x height' format (e.g., 3x3):

2x2

 ☐

☐ ☒

☐ ☐

***+ NOT MATCH ***

=====Intelligent Machine TURN=====

☐ ☐

☐ ☐

☐ ☐

=====Intelligent Machine - 1º GUESS=====

□ □
□ □
✂ □

Intelligent Machine has select: ✂

=====Intelligent Machine - 2º GUESS=====

□ ✂
□ □
✂ □

Intelligent Machine has select the pairs: ✂ and ✂

*** MATCH FOUND ***

□ ✂
□ □
✂ □

=====Intelligent Machine TURN=====

□ ✂
□ □
✂ □

=====Intelligent Machine - 1º GUESS=====

□ ✂
☒ □
✂ □

Intelligent Machine has select: ☒

=====Intelligent Machine - 2º GUESS=====

□ ✂
☒ ☒
✂ □

Intelligent Machine has select the pairs: ☒ and ☒

*** MATCH FOUND ***

□ ✂
☒ ☒
✂ □

=====Intelligent Machine TURN=====

```

□  🐾
? ?
🐾 □

=====Intelligent Machine - 1º GUESS=====

□  🐾
? ?
🐾 🐾

Intelligent Machine has select: 🐾

=====Intelligent Machine - 2º GUESS=====

🐾 🐾
? ?
🐾 🐾

Intelligent Machine has select the pairs: 🐾 and 🐾

*** MATCH FOUND ***

🐾 🐾
? ?
🐾 🐾

=====GAME IS OVER=====

Results are:

Player 1: has matched 0 pairs - Total Score: 0
Machine: has matched 3 pairs - Total Score: 6

=====WINNER=====

Machine WINS

Machine TOTAL SCORE: 6

```

Prueba 6: Niveles de Dificultad - Difícil

```

=====Welcome to Memory=====

```

```

=====Menu=====

```

Choose the game mode

1. Play - Player 1 vs Player 2

2. Play - Player vs Machine

3. Play - Machine 1 vs Machine 2

4. Exit

Select a option(1-4): 2

=====GAME STARTS=====

=====PLAYER VS PLAYER=====

Please, enter the board size in the format 'width x height'. Example: 5x6

The maximum allowed size is 5x6

2x3

=====Difficulty Menu=====

Choose machine difficulty

1. Easy

2. Medium

3. Hard

4. Exit

Select a option(1-3): 3

=====Player 1 TURN=====

☐ ☐

☐ ☐

☐ ☐

=====Player 1 - 1º GUESS=====

Enter the answer in 'width x height' format (e.g., 3x3):

1x1

 ☐

☐ ☐

☐ ☐

=====Player 1 - 2º GUESS=====

Enter the answer in 'width x height' format (e.g., 3x3):

2x1

☐ ☐

☐ ☐


***+ NOT MATCH ***

=====Super Inteligen Machine TURN=====



☐ ☐
☐ ☐
☐ ☐



=====Super Inteligen Machine - 1º GUESS=====

 ☐
☐ ☐
☐ ☐



Super Inteligen Machine has select: 

=====Super Inteligen Machine - 2º GUESS=====

 ☐
☐ ☐
☐ 

Super Inteligen Machine has select the pairs:  and 

*** MATCH FOUND ***


 ☐
☐ ☐
☐ 

=====Super Inteligen Machine TURN=====

 ☐
☐ ☐
☐ 


=====Super Inteligen Machine - 1º GUESS=====

 
☐ ☐
☐ 

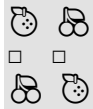
Super Inteligen Machine has select: 

=====Super Inteligen Machine - 2º GUESS=====

 
☐ ☐
 

Super Inteligen Machine has select the pairs:  and 

*** MATCH FOUND ***




=====Super Inteligen Machine TURN=====



=====Super Inteligen Machine - 1º GUESS=====



Super Inteligen Machine has select: 

=====Super Inteligen Machine - 2º GUESS=====



Super Inteligen Machine has select the pairs:  and 

*** MATCH FOUND ***



=====GAME IS OVER=====

Results are:

Player 1: has matched 0 pairs - Total Score: 0

Machine: has matched 3 pairs - Total Score: 6

=====WINNER=====

Machine WINS

Machine TOTAL SCORE: 6

Criterios de Evaluación Cumplidos

ETAPA 1: Creación del tablero (20%)

- Implementación completa de la lógica de tablero
- Validación de dimensiones y paridad
- Distribución aleatoria de emojis

ETAPA 2: Modo Persona vs Persona (25%)

- Sistema de turnos funcionando
- Validación de jugadas
- Conteo de puntuación

ETAPA 3: Modo Persona vs Máquina (15%)

- Tres niveles de dificultad
- Inteligencia artificial implementada
- Interacción jugador-máquina

ETAPA 4: Modo Máquina vs Máquina (10%)

- Funcionamiento automático
- Visualización de jugadas
- Resultado final correcto

ETAPA 5: Diseño y Optimización (10%)

- Código modular y organizado
- Manejo de errores
- Interfaz clara y usable

DOCUMENTACIÓN Y PRUEBAS

- Documentación detallada
- Pruebas exhaustivas
- Comentarios explicativos