Documentación del Juego de Memoria

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Índice

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()`

   o Inicializa el tablero de juego

   o Valida las dimensiones introducidas

   o Asegura que el área del tablero sea par

3. `start()`

   o Método principal que controla el flujo del juego

   o Maneja los turnos y la lógica de cada modo de juego

o Implementa las diferentes estrategias de la máquina

4. `get_valid_guess()`

o Obtiene y valida las jugadas de jugadores y máquinas

o 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()`

o Manejan la visualización del tablero

o 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
🍒 □
□   □
□   □
```

```
========Player 1 - 2º GUESS========

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

**+ 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
```

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========
```
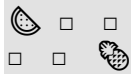
🍉 ☐ ☐
☐ ☐ 🍓

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========

☐ ☐ ☐
▯ ☐ 🍓
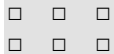
Machine 1 has select the pairs: ▯ and 🍓

+ 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========
```
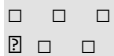
========Machine 1 - 1º GUESS========

□   □   🔲
🔲 □   🍍

Machine 1 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 has select: 🥥

=======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

Machine 2: has matched 2 pairs - Total Score: 4

=======WINNER=======

Machine 2 WINS

Machine 2 TOTAL SCORE: 4

Prueba 5: Validación de Entrada

```
========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
5x7

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

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

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

Invalid format. Please use 'width x height' (e.g., 3x3).
5x6

========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 *

========Inteligent Machine TURN========

□   □
□   □
□   □

========Inteligent Machine - 1º GUESS========

□   □
□   □
🐾 □

Inteligent Machine has select: 🐾

========Inteligent Machine - 2º GUESS========

□   🐾
□   □

🥭 □

Inteligent Machine has select the pairs: 🥭 and 🥭

*** MATCH FOUND ***

□ 🥭
□ □
🥭 □

========Inteligent Machine TURN========

□ 🥭
□ □
🥭 □

========Inteligent Machine - 1º GUESS========

□ 🥭
▯ □
🥭 □

Inteligent Machine has select: ▯

========Inteligent Machine - 2º GUESS========

□ 🥭
▯ ▯
🥭 □

Inteligent Machine has select the pairs: ▯ and ▯

*** MATCH FOUND ***

□ 🥭
▯ ▯
🥭 □

========Inteligent Machine TURN========

□ 🥭
▯ ▯
🥭 □

========Inteligent Machine - 1º GUESS========

□ 🥭
▯ ▯
🥭 🖐

```
Inteligent Machine has select: 🐢

========Inteligent Machine - 2º GUESS========

🐢 🦎
▯ ▯
🦎 🐢

Inteligent 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