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User Manual

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Introduction

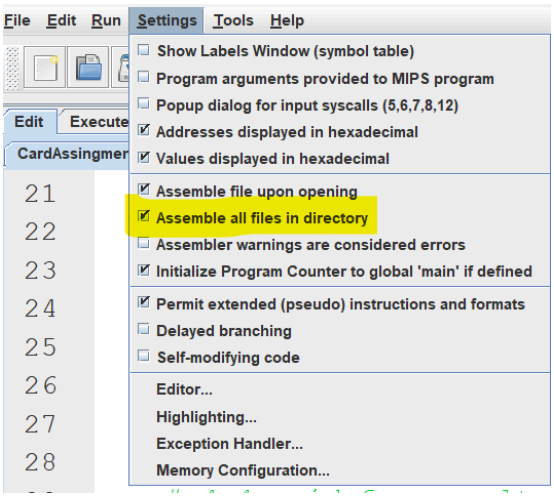
This is a math matching game created in the MIPS Assembly language. This tool helps you understand how to set up the program and play the game. To ensure an easy experience, please read this carefully.

Setup

There are 10 files that need to be opened in the MARS Simulator for the game to run. Here is a list of them:

- CardAssignments.asm
- DisplayGrid.asm
- DisplayInstructions.asm
- GameLogic.asm
- GetInput.asm
- **main.asm (this is the file you run)**
- replay.asm
- SysCalls.asm
- timer.asm
- unmatched_counter.asm

Open all of them in the MARS simulator. Since all of these files are in a folder, make sure that the setting **"Assemble all files in directory"** is turned on, as seen in the image on the bottom right corner of this page. If this is off, the program will not work.



Gameplay

Once you have all the files opened, click on **main.asm** first. The game must be assembled when **main.asm** has been selected. After that, click this button:  . This

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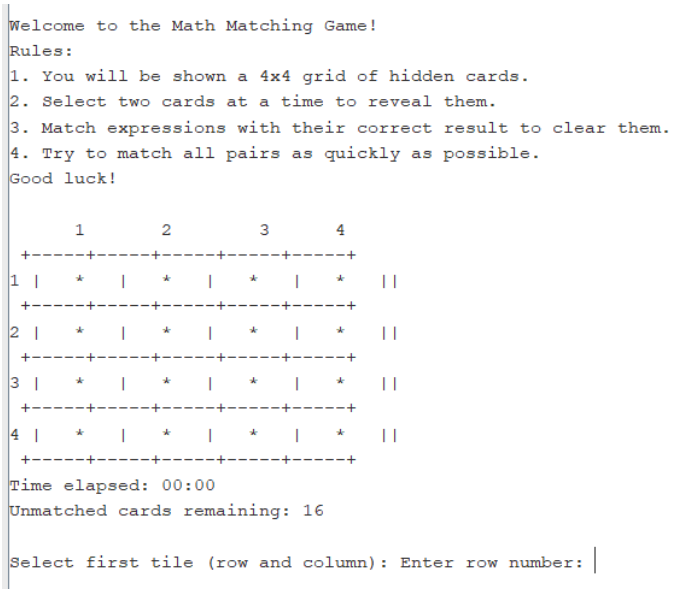
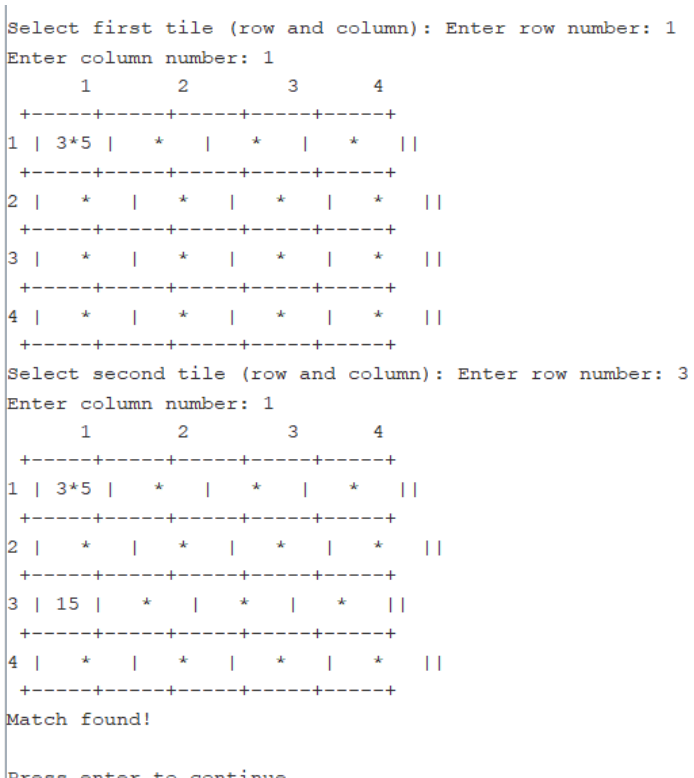
button will start the game. Once that is done, this will appear on the screen, as seen in the image below.



The game will give brief instructions. A 4 by 4 grid will be displayed. Each cell of the grid has an asterisk, concealing the expression or number that is hidden behind it. Below the grid, there is a timer showing the time you have spent playing this game, measured in minutes and seconds. Below the timer, there is a counter showing the number of unmatched cards that are remaining. When the number of unmatched cards reaches zero (0), the game will be complete. Below the counter, you will be asked to input the coordinate of the first tile and the second tile. Please refer to the image below.



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As seen in the image, the coordinate for the first tile is row 1, column 1. In order to input the row number, press a number from **1 to 4**, then press enter, to input the row number you wish to select. In order to input the column number, press a number from **1 to 4**, then press enter, to input the column number you wish to select.

If you enter any other value, you will receive an error message, telling you to input **1 through 4**.

```
Select first tile (row and column): Enter row number: 5
Enter column number: 5
Invalid coordinate. Please enter a number between 1 and 4.
Enter row number: 7
Enter column number: 9
Invalid coordinate. Please enter a number between 1 and 4.
Enter row number:
```

As seen in the image above, the game will **not** advance until a number between **1 and 4** have been inputted.

If you input coordinates for cards that do not end up matching each other, the game will inform you that you have the cards that do not match. The cells for the coordinates that you have inputted in will reset and will show asterisks again. Please refer to the image below.

```
Select first tile (row and column): Enter row number: 1
Enter column number: 4
      1       2       3       4
 +-----+-----+-----+-----+-----+
1 |   *   |   *   |   *   | 2*9 ||
 +-----+-----+-----+-----+-----+
2 |   *   |   *   |   *   |   *   ||
 +-----+-----+-----+-----+-----+
3 |   *   |   *   |   *   |   *   ||
 +-----+-----+-----+-----+-----+
4 |   *   |   *   |   *   |   *   ||
 +-----+-----+-----+-----+-----+
Select second tile (row and column): Enter row number: 3
Enter column number: 1
      1       2       3       4
 +-----+-----+-----+-----+-----+
1 |   *   |   *   |   *   | 2*9 ||
 +-----+-----+-----+-----+-----+
2 |   *   |   *   |   *   |   *   ||
 +-----+-----+-----+-----+-----+
3 | 15 |   *   |   *   |   *   ||
 +-----+-----+-----+-----+-----+
4 |   *   |   *   |   *   |   *   ||
 +-----+-----+-----+-----+-----+
No match, try again.

Press enter to continue...

      1       2       3       4
 +-----+-----+-----+-----+-----+
1 |   *   |   *   |   *   |   *   ||
 +-----+-----+-----+-----+-----+
2 |   *   |   *   |   *   |   *   ||
 +-----+-----+-----+-----+-----+
3 |   *   |   *   |   *   |   *   ||
 +-----+-----+-----+-----+-----+
4 |   *   |   *   |   *   |   *   ||
 +-----+-----+-----+-----+-----+
Time elapsed: 00:05
Unmatched cards remaining: 16
```

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As you progress through the game, inputting in row numbers and column numbers to find cards that match, you will eventually reach the end. After you match all the cards, you will see a line telling you how long it took for you to complete the game. Please refer to the image below.

```
Well Done! You finished in 00:34

Would you like to play again? (y/n):
```

You will also receive a message telling you if you would like to play again. In order to respond to this message, press **'y' or 'Y'**, meaning yes, to replay again. If you wish to end the game, press **'n' or 'N'**, meaning no, to end the game. Should you press **'y' or 'Y'** to play again, this is what you will see, in the image below.

```
Welcome to the Math Matching Game!
Rules:
1. You will be shown a 4x4 grid of hidden cards.
2. Select two cards at a time to reveal them.
3. Match expressions with their correct result to clear them.
4. Try to match all pairs as quickly as possible.
Good luck!

      1       2       3       4
 +-----+-----+-----+-----+-----+
1 |   *   |   *   |   *   |   *   ||
 +-----+-----+-----+-----+-----+
2 |   *   |   *   |   *   |   *   ||
 +-----+-----+-----+-----+-----+
3 |   *   |   *   |   *   |   *   ||
 +-----+-----+-----+-----+-----+
4 |   *   |   *   |   *   |   *   ||
 +-----+-----+-----+-----+-----+
Time elapsed: 00:00
Unmatched cards remaining: 16

Select first tile (row and column): Enter row number:
```

You will see the same screen that you have seen when you have played for the first time. It is the same as the previous time you have played this game. Nothing will have changed. Play the game as usual.

If the user wins the game, then there is a winning message displayed by the game and a victory sound is played to congratulate the user. Should the user want to play the game again, they can type **'n' or 'N'** for no and the game will stop running. If they type **'y' or 'Y'** , then they are redirected to the same screen as the start.

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```
Would you like to play again? (y/n): n
Thanks for playing!
```

That is all. Have fun!