

## Concentration Game

This game is modelled off the Concentration card game ([Concentration \(card game\) - Wikipedia](#)) but only has 10 cards. Players will first be shown the start screen as displayed in Figure 1. To proceed to the rules page (Figure 2), click the space bar on the PS2 controller.

### CONCENTRATION GAME

PRESS SPACE BAR TO START



Figure 1. Displays the start page

### GAME RULES

1. PLAYER FLIPS OVER TWO CARDS THAT ARE FACED DOWN
2. IF THE TWO CARDS HAVE THE SAME SYMBOL THEN PLAYER GAINS A POINT. THE PAIRED CARDS WILL STAY FACED UP. IF THE CARDS ARE DIFFERENT, THE CARDS WILL FACE DOWN AGAIN
3. THE TURNS SWITCH AND PLAYER 2 GOES
4. THE GAME ENDS ONCE ALL THE PAIRS ARE FOUND
5. PLAYER WITH THE MOST POINTS WINS!

TO FLIP CARDS: SW 0 - 4 IS TOP ROW LEFT TO RIGHT  
SW 5 - 9 IS BOTTOM ROW LEFT TO RIGHT

PRESS SPACE TO CONTINUE

Figure 2. Displays the rules page

To begin the game, the player will click the space bar again. Once the game begins, there will be 10 cards that are faced down as displayed in Figure 3. The cards will be randomly shuffled each time the game starts with the same five pairs. This means that two cards will always have the same symbol. This game will be between two players with each player's score displayed on

the HEX display. Player 1's score is displayed on HEX0, and player 2's score is displayed on HEX4.

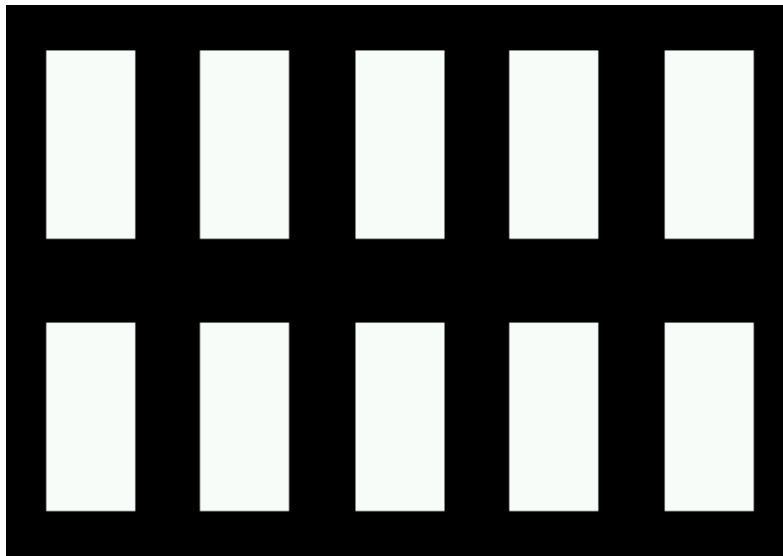


Figure 3. 10 cards that are faced down

During each turn, the player needs to turn over two cards. Player 1 goes first. If the two cards have the same symbol (Figure 4) the player will gain a point. The two cards will remain turned over for the rest of the game. If the two cards are different, the cards will flip over and the player does not get a point. Make sure to wait until the terminal displays "Player 1's turn!" or "Player 2's turn!" before selecting the next cards. The game ends once all cards are turned over as displayed in Figure 5.

To turn over a card, players will choose a switch from 0 - 9. SW0 will be the leftmost card on the top row. SW5 will be the leftmost card on the bottom row.

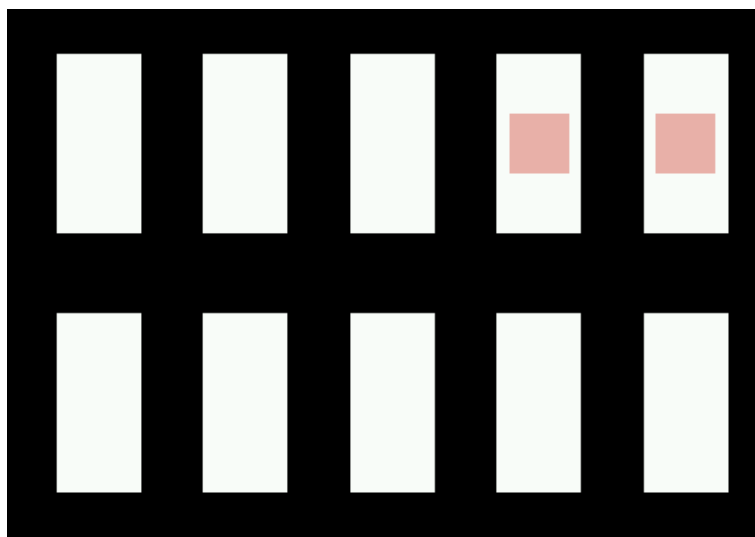


Figure 4. Displays a pair of cards



Figure 5. All pairs are found and the game is over

Once all pairs are found, the game is over. The player with most points wins the game. Depending on which player wins, an end screen will be displayed, as shown in Figure 6. To replay the game, click space bar on the PS2 controller and it will redirect the player back to the start screen in Figure 1. Both player's scores will be reset to 0.



Figure 6. End screen if Player 2 wins the game

### Attribution Table

Tasks	Description	Completed By (I did the project by myself)
DE1-soc input	SW keys, PS2 controller input	Sissi
DE1-soc output	HEX display	Sissi
VGA display	Drawing pixels during game, Displaying images using C arrays	Sissi
Game logic	How the game proceeds	Sissi
Other functions	Shuffling cards using rand	Sissi