Tombola Game Simulation Using MATLAB

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***Abstract*—This project simulates a tombola game using MATLAB. The game involves five players, each with a unique card containing 15 random numbers between 1 and 100. The goal is to simulate the drawing of numbers and track the progress of each player as they aim to achieve "cinko" and eventually complete the game. The program ensures the uniqueness of each player's card numbers and tracks the drawn numbers, updating the status of each player's card accordingly.**

***Index Terms*—MATLAB, Tombola, Game Simulation, Random Numbers, Data Processing**

I. Introduction

Tombola is a popular game of chance in which players attempt to match numbers on their cards with randomly drawn numbers. This project aims to simulate a tombola game using MATLAB, ensuring that each player's card has unique numbers and tracking the game's progress through several iterations.

II. Methodology

The simulation involves three main steps:

- Generating unique random cards for each player.
- Drawing random numbers and updating the status of each player's card.
- Checking for "cinko" and completion of the game.

III. Card Generation

Each player's card contains 15 random numbers between 1 and 100. The code ensures that there are no duplicate numbers on any card by iterating through the card and replacing duplicates.

```
clc
close
clear all

% Card generation
oyuncu_1_card= randi(100,1,15);
oyuncu_2_card= randi(100,1,15);
oyuncu_3_card= randi(100,1,15);
oyuncu_4_card= randi(100,1,15);
oyuncu_5_card= randi(100,1,15);

% Detect same values, if exists replace same number
for k=1:20
    for i=1:14
        for j=i+1:15
            if oyuncu_1_card(i)==oyuncu_1_card(j)
                while oyuncu_1_card(i) ==
    oyuncu_1_card(j)
                    oyuncu_1_card(j)=randi(100);
                end
            end
            % Repeat for other players...
        end
    end
end
```

Listing 1. Card Generation

IV. Game Simulation

The game proceeds by randomly drawing numbers between 1 and 100, marking them on each player's card, and checking for "cinko" and game completion.

```
% Begin game
number_array=1:100;
number_index=zeros(1,100);
index_oyuncu_1= zeros(1,15);
% Repeat for other players...

oyuncu_1_cinko=zeros(1,3);
% Repeat for other players...

for game_iteration=1:100
    % Randomly select new number among remaining
    numbers
    selected_number=randi(100);
    while number_index(selected_number)==1
        selected_number=randi(100);
    end
    number_index(selected_number)=1;

    % Search players cards for a given selected
    number
    for i=1:15
        if selected_number==oyuncu_1_card(i)
            index_oyuncu_1(i)=1;
        end
        % Repeat for other players...
    end

    % Check cinko-1
    if index_oyuncu_1(1) * index_oyuncu_1(2) *
    index_oyuncu_1(3) * index_oyuncu_1(4) *
    index_oyuncu_1(5) ==1
        oyuncu_1_cinko(1)=1;
    end
    % Repeat for other players and cinko-2, cinko
    -3...
end
```

Listing 2. Game Simulation

V. Results and Discussion

The simulation successfully generates unique cards for each player and tracks the progress of the game. The program prints the results of each "cinko" and announces the completion of the game for each player.

```
% Detect cinko change
if(sum(oyuncu_1_cinko) ~= sum(
    oyuncu_1_previous_cinko))
    fprintf('Game iteration %d, Player 1 found Cinko
     %d \n',game_iteration,sum(oyuncu_1_cinko))
end
% Repeat for other players...

% Detect game completion
if(sum(oyuncu_1_cinko) ==3)
    fprintf('Game iteration %d, Player 1 Completed \
    n',game_iteration)
    oyuncu_1_cinko(4)=2;
end
% Repeat for other players...
```

Listing 3. Results and Output

VI. Conclusion

The MATLAB-based tombola game simulation effectively demonstrates the process of generating unique random cards, drawing numbers, and tracking the game's progress. This project serves as a practical example of applying MATLAB for game simulation and data processing tasks.

VII. Future Work

Future enhancements could include a graphical user interface for better visualization, support for more players, and additional game rules or variations.

References

[1] MathWorks, "MATLAB Documentation," 2024. [Online]. Available: https://www.mathworks.com/help/matlab/