

Android Assignment Software Documentation

Requirements Specification:

Implement a Tic-Tac-Toe game Android application. Must enable users play with app, must be displayed in a single screen, must design user interface, must design an algorithm for app to play, must follow Android design principle and best practices method.

Design Considerations:

- User interface design
- Game procedure design
- AI intelligence design
- Object Oriented method use
- Scalability
- Interesting

Design Implementation:

- What is object in the app?

Each cell on game board, three kinds of cells, circle cell, cross cell, empty cell.

- What happen after player touch?

1/detect if this piece be drawn?

2/if yes, remind player; if no, draw which piece player touch

3/check if win?

4/if win, remind player win, restart game; if no, change play turn

5/call computer to draw, computer draw based on algorithm

6/check if win?

7/if win, remind computer win, restart game; if no, wait for player to touch

- How computer draw?

1/detect all square

2/use algorithm:

Win: if computer connected 2 pieces and the 3rd is available, draw the 3rd piece

Block: if player connected 2 pieces and the 3rd is available, draw player's 3rd

Fork: if computer has a chance to connect 2 pieces, draw the 2nd piece

Block fork: if player has a chance to connect 2 pieces, draw player's 2nd piece

Center: if no above pieces available, draw piece on the center

Opposite: if no above pieces available, draw piece on the opposite of opponent's last pieces

Corner: if no above pieces, draw piece on the empty corner

Side: if no above pieces, draw piece on the empty side

- How to check if win?

1/check all rows

2/check all columns

3/check all diagonal lines

Test Plan:

Normal Test:

Case 1: Player play first, check if computer can play after that.

Case 2: After computer placed piece, check if player can continue place pieces.

Case 3: Keep play, check if app can detect someone is win.

...

Corner Test:

Case N: Check if player place two pieces at the same time.

Case N+1: Check if player place pieces on the filled square.

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Future Improvements:

- Creative User Interface:

1. once a piece is placed, the piece will turn grey or drop down with shadow
2. long press, show all possible win steps of that piece

- Creative Functionality:

1. piece will disappear after 6 steps.

For example, when place the 7th piece, the 1st placed piece will disappear

2. take over opponent's pieces, change cross to circle if the whole row or column or diagonal line are filled

3. resize game board/change player turn

Note:

Designed during trips and flights in hurry. Realized basic play function and AI algorithm, designed but not completed the creative user interface and more game play methods.

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