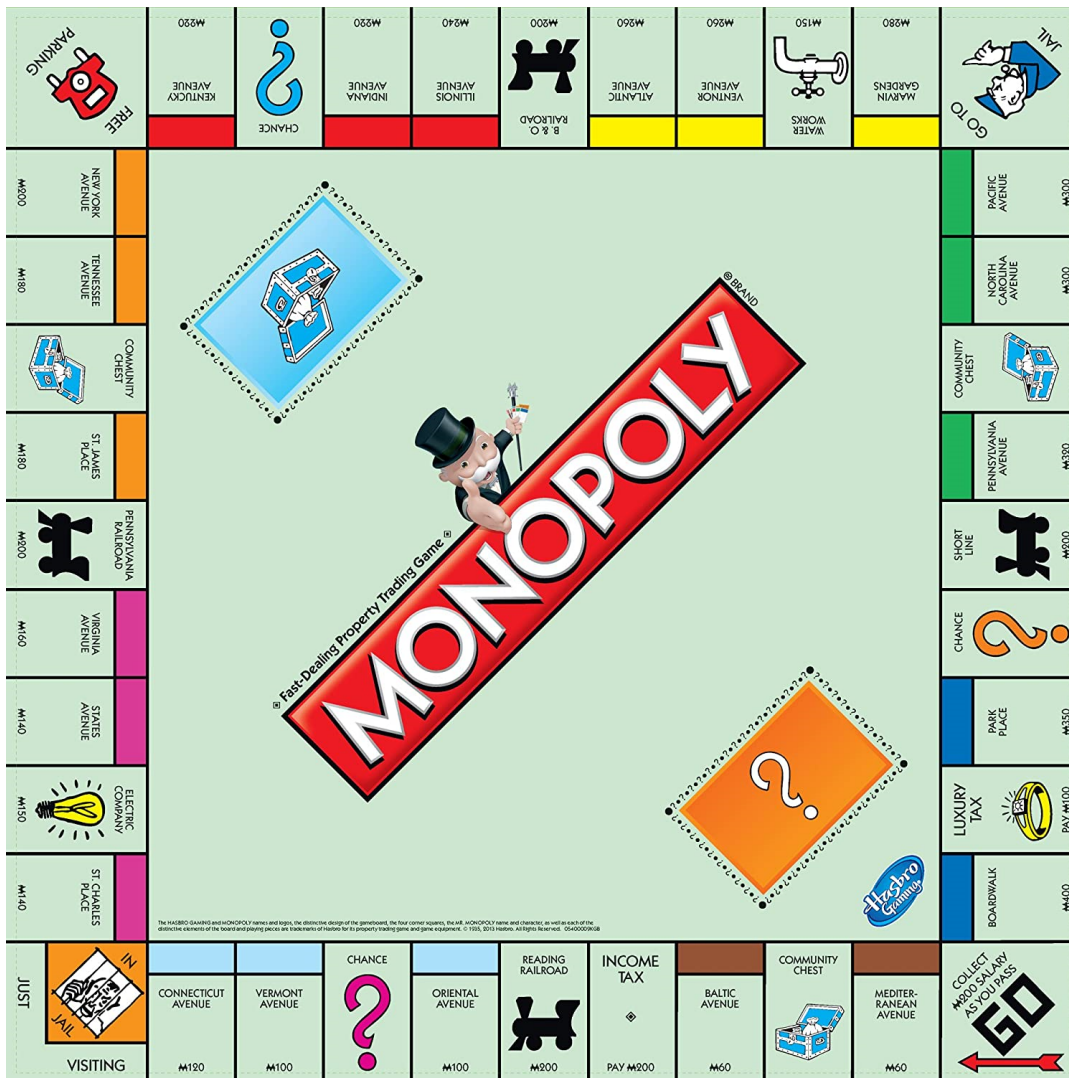


```
include_graphics('board.png')
```



Rules for movement

The Monopoly Board is effectively a circle with 40 spaces on which a player can land. Players move from space to space around the board in a circle (square).

The number of spaces a player moves is determined by the roll of 2 dice. Most often, the player will roll the dice, move the number of spaces shown on the dice, land on a space, and end their turn there. If this were the entire game, there would be an equal probability of landing on all 40 spaces after many turns - and the distribution of space frequency would be uniform.

There are, however, several rules which create variation in the frequency of landing on different spaces.

Go to Jail

One space, “Go to Jail” sends players directly to jail (there is a jail space on the board). This space never counts as having been landed upon. As soon as the player ‘lands’ here, he is immediately sent to jail, and the jail space gets counted as landed upon. This is the only space on the game board that moves a player’s piece. The count of how often this space is landed on will always be 0.

Rolling Doubles

If a player rolls doubles (two of the same number), the player moves his piece, and then gets to roll the dice again for another move. However, if a player rolls doubles three times in a row, he is sent directly to jail. (The third space that the player would have ‘landed on’ does not count, but the jail space gets counted as landed on.)

Card Decks: Chance and Community Chest

A player can land on a “Chance” or “Community Chest” space. When a player lands on these spaces, he draws a card from the respective deck and follows its instructions. The instructions will sometimes give money to or take money from the player with no change in the player’s position on the board. Other times, the card will instruct the player to move to another space on the board. The list of cards that can be drawn from each deck is provided.

There are nine cards in the Chance deck that move the player’s token. There are two cards in the Community Chest deck that move the player’s token. All other cards do not move the player’s token. For the sake of this simulation, you only need to program actions for the cards that move the tokens. There is no need to do anything for ‘get out of jail’ or any of the other cards.

A card may say ‘move to the nearest railroad’ or ‘move to the nearest utility’ or even ‘go to property ...’. In these cases, the player always moves forward. So if a player is on ‘Oriental Avenue,’ the nearest railroad is ‘Pennsylvania Railroad’ and NOT ‘Reading Railroad.’

For the sake of this simulation, the Chance and Community Chest get counted as landed on when the player lands on the Chance or Community Chest space. The player may also generate another count if the card moves the player to another space on the board. In those cases, a tally is counted for the Chance/Community Chest space, the token is moved, and then a tally is counted for the space where the player ends his turn.

Jail

Jail is the most complicated aspect of this simulation.

If a player lands on space 11 (Jail) simply from rolling the dice, he is not in Jail. He is ‘just visiting’ jail. He generates a tally for landing on jail, and his play continues on as normal.

A player can be *sent to jail* in several ways:

- he rolls doubles three times in a row;
- he lands on the “go to jail” space;
- he draws a card that sends him to jail.

As soon as the player is *sent to jail*, his token moves to jail (space 11), he generates a count for landing on jail, and his turn ends immediately.

On the next turn, the player begins in jail and the player will roll the dice. If he rolls doubles on the dice, he gets out of jail and moves the number of spaces the dice show. However, even though he rolled doubles, he does NOT roll again. He takes his move out of jail and his turn ends. If he does not roll doubles, he stays in jail.

A player cannot stay in jail for more than three turns. On the third turn he begins in jail, he rolls the dice and moves the number of spaces the dice show no matter what. If he rolls doubles, he exits but does not roll again. If he does not roll doubles, he still exits and does not roll again.

Play then continues as normal.

For this simulation, each time a player ends his turn in Jail, a tally will be counted as having been ‘landed upon.’

There are more rules on jail that include paying a fee to get out early, or using a get out of jail free card. We will not implement those rules. We will simply simulate a ‘long stay’ strategy for Jail. This means that the player will never pay the fee to get out jail early. He will roll the dice and only leave jail if he gets doubles or it is his third turn in jail.