

TWENTY ONE

(It's Black Jack but not really!!)





Introduction

TwentyOne is a game of chance. The chance of winning is based on the cards dealt by the program. The game is similar to Blackjack, but differs in some areas, so please read this section carefully.

All players in the game place their bets after receiving their first card. Once everyone has placed their bets, the participants get a second card.

One by one, the players of the game get the opportunity to play until they are finished. This means that player 1 plays until they stand or are bust, after which player 2 plays, etc. Each play, the players have the option to 'stand' (hold your total and end your turn, you cannot play any further), 'hit' (ask for a card to bring your points as close as possible to 21), or perform special actions (here only 'split'). If a player has more than 21 points in her hand, they are 'bust', and her bets are lost.

If all players are ready (stand or bust) the bank must play (only if there are players who are not bust). The rules for the bank are simple: The bank must hit when it has a total of 16 points or less and must stand with a total of 17 points or more. When the bank and player have the same number of points, the bank wins. If the bank has more than 21 points, the bank is bust and all players that are standing, win. A player who wins, gets the amount that was betted back in double.

When a player gets two cards with the same value, they can choose to 'split'. This means that the cards are placed next to each other on the table and the player can play twice, one game per card. The bet doesn't split but both cards get the original bet amount.

The number of points for the cards is as follows:

- King 3 points, queen 2 points, jack 1 point.
- Ace is 1 or 11 points. Normally it counts as 11, unless that busts the hand. Then it will count as 1.
- Cards 2 to 10 have their normal point value.
- The 'suit' of the card is not important.
- The Joker does not play

Note that the game cannot have more than **6 players** as we have only 2 decks being used in the game.



An Example

For this example, let's consider that there are 3 players playing the game. Here is how the game would look like. This example covers all the scenarios that are present in this game.

- One card is distributed to each of the 3 players (face up – meaning players can see each others' cards)
- Once the first card is distributed, the bank asks each player (one after another) to place their bets
- Let's say player one gets a A, the current value she's holding is 11 and she decides to place a bet of 80\$. She decides to Hit (draw the card from the deck). Remember that the aim of each player is to get as close as possible to 21 (that's why the game is named as 21). Let's say she gets 9. She is now holding a cumulative value of 20 (quite close to 21). Now, she decides to Stand meaning she wants to end her turn as she is already quite close to 21. This is the simplest scenario possible.
- The bank now deals with player B. Let's say player B is holding 7 and has placed a bet of 70\$. He decides to Hit and gets a 10. He is now holding 17. So, he decides to hit to try his luck and gets a 6. The total now becomes 23 and he's busted (he is out) as he has crossed 21
- The bank now deals with player C. Let's say she is holding a 3 and has placed a bet of 50\$ and she decides to Hit getting another 3. Now she has an option to split her stack. If she decides to split, the player gets to play twice in a single round on her two different stacks.
Stack 1: She decides to hit, gets a 9, hits again gets a K, hits again and gets a 6. Now the total score on stack 1 would be 21 ($3+9+3(\text{value of K})+6$). And the player would not be allowed to play further as she already has a 21. In this case, she loses only if the bank too gets a 21
Stack 2: She decides to hit, gets a 7, hits again gets a 2, hits again and gets a J, hits again and gets a Q and decides to stand. Now the total score on stack 2 would be 15 ($3+7+2+1(\text{value of J})+2(\text{value of Q})$).
- Now the bank starts revealing as there is at least one player standing. Bank plays very similar to players but hits only if the cumulative value is lesser than 17. Let's consider that the bank gets a score of 19.
- In this case, Player A wins, Player C split 1 wins, split 2 loses



How to use the app

Now that you understood the game, let's talk about how to use this app to play the game. The game is very user friendly and easy to understand.

Step 1: Run the code using command

```
python3 ./21.py
```

Enter number of players. Note that the game is designed for a maximum of 6 people as it is using only two decks of cards.

Once the number of players are given, enter the number of rounds you would wish to play. The game then begins

```
chethankarur@Chethans-MacBook-Pro twenty_one % python3 ./21.py
Enter the number of players: 2
Enter the number of rounds: 2
-----
ROUND 1 STARTING IN...
-----
3 secs
2 secs
1 secs
```

Step 2: To make the game simpler to use, the first chance is given to player 1 during which he/she gets to see their first card after which the bank reveals it's first card. The program remembers the cards that the bank just opened and shows them to each player when they get their turn. Once the player 1 sees his/her card, he will then be prompted to place a bet amount. For ease of validation, the game is currently capped at 100\$ meaning each player can place a bet up to a maximum of 100\$ for each round.

```
PLAYER 1 CARDS:
  3
  ♥
  3

PLAYER 1 SCORE = 3
BANK CARDS:
  3
  ♦
  3

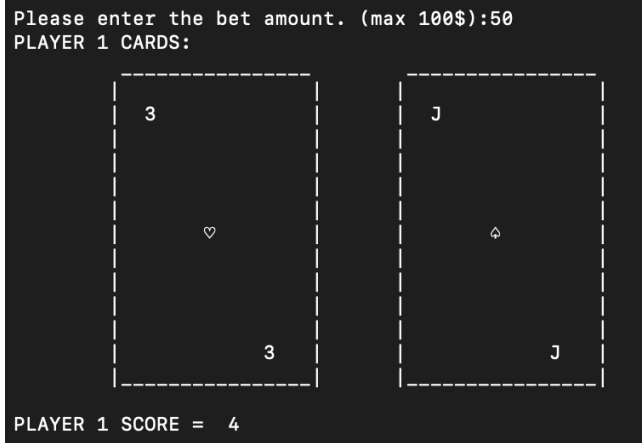
BANK SCORE = 3

Please enter the bet amount. (max 100$):50
```

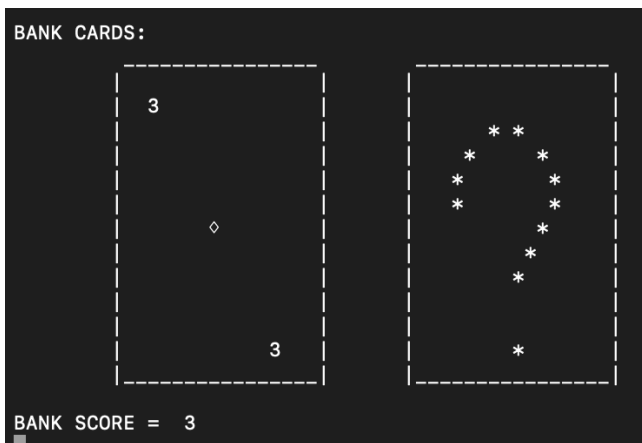


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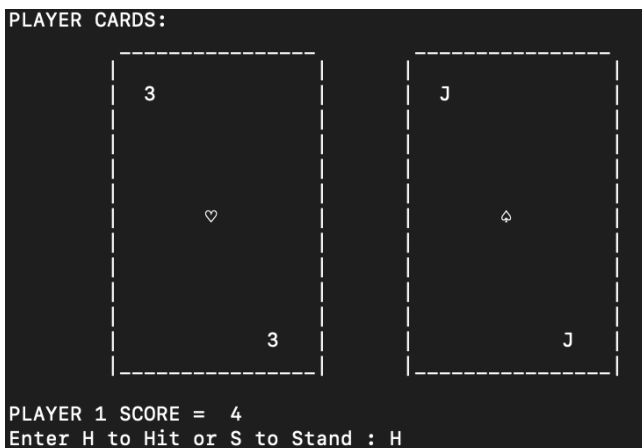
Step 3: Once the bet is placed, the bank gives second card to player 1 (face-up) and right below the cards, there is a mention of the updated score always.



Step 4: After the step 3, the bank then serves itself another card but this time face-down.



Step 5: The player then gets a chance whether to hit or stand. Input 'H' for hit and 'S' for stand





How to use the app

Step 6: This goes on until the player decides to stand or gets busted after which the player's turn ends.

```
Enter H to Hit or S to Stand : H
PLAYER CARDS:
  3      J      10
  ♥      ♠      ♦
  3      J      10

PLAYER SCORE = 14
Enter H to Hit or S to Stand : H
PLAYER CARDS:
  3      J      10      9
  ♥      ♠      ♦      ♥
  3      J      10      9

PLAYER SCORE = 23
PLAYER 1 BUSTED!
```

These 6 steps are applicable for all the players apart from the bank part as the bank has already opened its card and it keeps displaying until all the players' turns end.

Step 7: Once all the players finish their turn, a summary of the game is displayed as follows

```
-----
PLAYER 2 TURN ENDED!
-----

GAME SUMMARY:
-----

Player 1: Bet: 50, Score:23, Status:BUSTED
Player 2: Bet: 60, Score:19, Status:PLAYING
-----
```

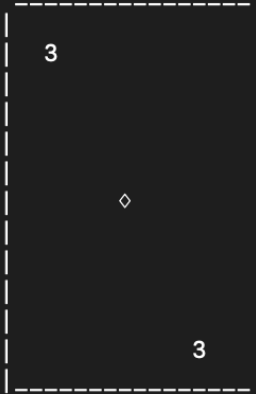
If there are one or more players still standing, the bank reveals its second card and hits if the value is less than 17 and stands if the value goes beyond that. The game results are then displayed at the end of each round. If no player is standing, it just skips and moves to the next round.



How to use the app

BANK IS REVEALING THE CARDS....

BANK CARDS:



BANK SCORE = 7

BANK DECIDES TO HIT.....

BANK CARDS:



BANK SCORE = 17

GAME RESULTS:

PLAYER 2 Won. Banks pays: 60

Note: As we know A's value can either be 11 or 1, the logic is designed in such a way that the application picks the best possible value suitable for you.

Example: Hit 1: A,9 - total value: 20 (11+9)

Hit 2: A,9,5 - total would be 16 (1+9+5)

During the second hit, the application chooses the value 1 to avoid the player from getting busted.



How to use the app

Split option: When the player gets his/her second card and it has same value as that of the first card, she gets an option to split the cards into two hands. If chosen Yes, the player can play two turns in one round

Example:

- a. **Starting round** - The player receives an A and places a bet, e.g. \$100
- b. **Round 1** – The player decides to ‘hit’ and the player receives another A
Now the player has an option to split. The ‘second’ hand of this player has the same bet amount as the ‘first’ hand of this player, in this case \$100. So, hand 1 [A] and hand 2 [A], both with a \$100 bet. But these are now separate games for this player.
- c. **Still round 1, split 1** – The player needs to decide to stand/hit
 - Player finishes hand 1 by going through multiple rounds, e.g. hit/stand/bust

```
Cards with same value found!
Would you like to split Y/N?: Y
press enter to continue

Player 1 round 1 split 1:
PLAYER CARDS:

  K
  ♥
  K

PLAYER 1 SCORE = 8
Enter H to Hit or S to Stand : H
PLAYER CARDS:

  K      J
  ♥      ♣
  K      J

PLAYER SCORE = 9
```




How to use the app

```
Enter H to Hit or S to Stand : H
PLAYER CARDS:

  K      J      8      5
  ♥      ♠      ♠      ♠
  K      J      8      5

PLAYER SCORE = 22
PLAYER 1 BUSTED!
```

d. Round 1, split 2 - The player needs to decide to stand/hit

- Player finishes hand 2 by going through multiple rounds, e.g. hit/stand/bust

```
Player 1 round 1 split 2:
PLAYER CARDS:

  K
  ♦
  K

PLAYER 1 SCORE = 8
Enter H to Hit or S to Stand : H
PLAYER CARDS:

  K      5
  ♦      ♥
  K      5

PLAYER SCORE = 13
Enter H to Hit or S to Stand : H
PLAYER CARDS:

  K      5      5
  ♦      ♥      ♠
  K      5      5

PLAYER SCORE = 18
Enter H to Hit or S to Stand : S
-----
PLAYER 1 TURN ENDED!
```

Once the player with split ends his/her game, the bank then deals with the next player.