

Homework 2

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Black Jack probabilities

```
deck <- read.csv("deck.txt")
head(deck)
```

```
##   face  suit value
## 1 king spades   10
## 2 queen spades  10
## 3 jack spades   10
## 4  ten spades   10
## 5  nine spades    9
## 6 eight spades   8
```

Casino has 4 decks:

```
deck <- as.data.frame(lapply(deck, rep, 4))
```

Shuffle

```
shuffle_deck <- function(cards) {
  n = nrow(cards)
  random <- sample(1:n, size = n)
  cards[random, ]
}
```

Start of the game

```
start_game <- function(cards) {
  curr_deck <- shuffle_deck(cards)
  dealer <- curr_deck[1:2,]
  curr_deck <- curr_deck[-(1:2),]
  player <- curr_deck[1:2,]
  curr_deck <- curr_deck[-(1:2),]
```

```

stats <- function() {
  cat("Dealer's hand:", fill = T)

  print(dealer, row.names = F)

  cat("sum", sum(dealer$value), fill = T)

  cat("Player's hand:", fill = T)

  print(player, row.names = F)

  cat("sum", sum(player$value), fill = T)

  if (sum(dealer$value) <= sum(player$value) && sum(player$value) < 21) {
    cat("chances 100%")
  } else if (sum(player$value) > 21) {
    cat("chances 0%")
  } else {
    A = 21 - sum(player$value)
    B = sum(dealer$value) - sum(player$value)

    good_cards <- sum(curr_deck$value >= B & curr_deck$value <= A)
    cat("chances", good_cards/nrow(curr_deck)*100, "%")
  }
}

stats()
}

```

Also, how do I print the data frame without column names? I tried googling, but failed to find the answer

Deal

```

deal <- function() {
  player[nrow(player)+1, ] <- shuffle_deck(curr_deck)[1, ]
  curr_deck <- curr_deck[-1,]
  stats()
}

```

End of the game

```

stop_game <- function() {
  if (sum(dealer$value) <= sum(player$value) && sum(player$value) < 21) {
    print("You won")
  }
  else {
    print("You lost")
  }
}

```

Game 1

```
start_game(deck)
```

```
## Dealer's hand:  
## face suit value  
## four spades 4  
## four spades 4  
## sum 8  
## Player's hand:  
## face suit value  
## king hearts 10  
## three spades 3  
## sum 13  
## chances 100%
```

```
deal()
```

```
## Dealer's hand:  
## face suit value  
## four spades 4  
## four spades 4  
## sum 8  
## Player's hand:  
## face suit value  
## king hearts 10  
## three spades 3  
## two clubs 2  
## sum 15  
## chances 100%
```

```
stop_game()
```

```
## [1] "You won"
```

Game 2

```
start_game(deck)
```

```
## Dealer's hand:  
## face suit value  
## six spades 6  
## six spades 6  
## sum 12  
## Player's hand:  
## face suit value  
## ten hearts 10  
## queen diamonds 10  
## sum 20  
## chances 100%
```

```
stop_game()
```

```
## [1] "You won"
```