

HW2 Milrud

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Casino deck

```
deck <- read.csv('~/.Applied-Statistics-R-HW/deck.csv')
head(deck,n=3)
```

```
##   face  suit value
## 1 king spades   10
## 2 queen spades  10
## 3 jack spades   10
```

```
nrow(deck)
```

```
## [1] 52
```

```
decks<-do.call("rbind",list (deck,deck,deck,deck))
nrow(decks)
```

```
## [1] 208
```

Dialer's hand

```
dealer_emp<-data.frame(face=character(),suit=character(), value=integer())
```

Player's hand

```
player_emp<-data.frame(face=character(),suit=character(), value=integer())
```

Shuffle function

```
shuffle_deck<-function(cards) {
  random<-sample(1:208, size = 208)
  cards[random, ]
}
```

Start game

Chances calculation function

```
chances<-function(dealer_sum, player_sum,decks) {  
  min_range<-dealer_sum-player_sum  
  max_range<-21-player_sum  
  cards_range<-decks[decks$value <= max_range & decks$value >= min_range, "value"]  
  chances<-(length(cards_range)/nrow(decks))*100  
}
```

Start game function

```
start_game<-function(dealer,player,casino_deck) {  
  #shuffle deck  
  casino_deck<-shuffle_deck(casino_deck)  
  
  #player's and dealer's hands  
  player<-casino_deck[1:2,]  
  casino_deck<-casino_deck[-(1:2),]  
  dealer<-casino_deck[1:2,]  
  casino_deck<-casino_deck[-(1:2),]  
  
  #sums  
  player_sum<-sum(player$value)  
  dealer_sum<-sum(dealer$value)  
  
  #chances  
  a=0  
  if (player_sum>=dealer_sum & player_sum<=21) {  
    a=100  
  } else if (player_sum>21) {  
    a=0  
  } else {  
    a<-chances(dealer_sum, player_sum,casino_deck)  
  }  
  
  #printing  
  cat(c("Dealers hand:", "\n"))  
  print(dealer,row.names = FALSE, right = FALSE)  
  cat(c("sum",dealer_sum), fill = TRUE)  
  cat("\n")  
  cat(c("\n", "Your hand:", "\n"))  
  print(player,row.names = FALSE, right = FALSE)  
  cat(c("sum",player_sum, "\n"))  
  cat(c("chances",round(a), "%"))  
  
  #return results  
  return(list(dealer,player,casino_deck))  
}
```

Deal function

```
deal<-function(dealer,player,casino_deck) {  
  #player's hands  
  player<-rbind(player,casino_deck[1,])  
  casino_deck<-casino_deck[-1,]  
  
  #sum  
  player_sum<-sum(player$value)  
  dealer_sum<-sum(dealer$value)  
  
  #chances  
  a=0  
  if (player_sum>=dealer_sum & player_sum<=21) {  
    a=100  
  } else if (player_sum>21) {  
    a=0  
  } else {  
    a<-chances(dealer_sum, player_sum, casino_deck)  
  }  
  
  #printing  
  cat(c("Dealers hand:", "\n"))  
  print(dealer,row.names = FALSE, right = FALSE)  
  cat(c("sum",dealer_sum), fill = TRUE)  
  cat("\n")  
  cat(c("\n", "Your hand:", "\n"))  
  print(player,row.names = FALSE, right = FALSE)  
  cat(c("sum",player_sum, "\n"))  
  cat(c("chances",round(a), "%"))  
  
  #return results  
  return(list(dealer,player,casino_deck))  
}
```

Stop game function

```
stop_game<-function(dealer,player,casino_deck) {  
  #sum  
  player_sum<-sum(player$value)  
  dealer_sum<-sum(dealer$value)  
  
  #win/loose  
  if (player_sum>=dealer_sum & player_sum<=21) {  
    cat("Result: Win")  
  } else {  
    cat("Result: Loose")  
  }  
}
```

Games

Test game 1

```
dealer<-dealer_emp  
player<-player_emp  
casino_deck<-decks
```

start

```
test1_start<-start_game(dealer,player,casino_deck)
```

```
## Dealers hand:  
## face suit      value  
## eight diamonds 8  
## eight diamonds 8  
## sum 16  
##  
##  
## Your hand:  
## face suit      value  
## three diamonds 3  
## two  hearts    2  
## sum 5  
## chances 0 %
```

deal

```
test1_deal<-deal(test1_start[[1]],test1_start[[2]],test1_start[[3]])
```

```
## Dealers hand:  
## face suit      value  
## eight diamonds 8  
## eight diamonds 8  
## sum 16  
##  
##  
## Your hand:  
## face suit      value  
## three diamonds 3  
## two  hearts    2  
## six   clubs     6  
## sum 11  
## chances 69 %
```

stop

```
test1_b<-stop_game(test1_deal[[1]],test1_deal[[2]],test1_deal[[3]])
```

```
## Result: Loose
```

Test game 2

```
dealer<-dealer_emp  
player<-player_emp  
casino_deck<-decks
```

start

```
test2_start<-start_game(dealer,player,casino_deck)
```

```
## Dealers hand:  
## face suit  value  
## jack spades 10  
## ace spades  1  
## sum 11  
##  
##  
## Your hand:  
## face suit  value  
## two spades 2  
## nine clubs 9  
## sum 11  
## chances 100 %
```

deal

```
test2_deal<-deal(test2_start[[1]],test2_start[[2]],test2_start[[3]])
```

```
## Dealers hand:  
## face suit  value  
## jack spades 10  
## ace spades  1  
## sum 11  
##  
##  
## Your hand:  
## face suit  value  
## two spades 2  
## nine clubs 9  
## king clubs 10  
## sum 21  
## chances 100 %
```

stop

```
test1_b<-stop_game(test2_deal[[1]],test2_deal[[2]],test2_deal[[3]])
```

```
## Result: Win
```