

R Notations

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read.csv

```
read.csv("../data/cards.csv")
```

##	face	suit	value
## 1	king	spades	13
## 2	queen	spades	12
## 3	jack	spades	11
## 4	ten	spades	10
## 5	nine	spades	9
## 6	eight	spades	8
## 7	seven	spades	7
## 8	six	spades	6
## 9	five	spades	5
## 10	four	spades	4
## 11	three	spades	3
## 12	two	spades	2
## 13	ace	spades	1
## 14	king	clubs	13
## 15	queen	clubs	12
## 16	jack	clubs	11
## 17	ten	clubs	10
## 18	nine	clubs	9
## 19	eight	clubs	8
## 20	seven	clubs	7
## 21	six	clubs	6
## 22	five	clubs	5
## 23	four	clubs	4
## 24	three	clubs	3
## 25	two	clubs	2
## 26	ace	clubs	1
## 27	king	diamonds	13
## 28	queen	diamonds	12
## 29	jack	diamonds	11
## 30	ten	diamonds	10
## 31	nine	diamonds	9
## 32	eight	diamonds	8
## 33	seven	diamonds	7
## 34	six	diamonds	6
## 35	five	diamonds	5
## 36	four	diamonds	4
## 37	three	diamonds	3
## 38	two	diamonds	2
## 39	ace	diamonds	1
## 40	king	hearts	13
## 41	queen	hearts	12
## 42	jack	hearts	11
## 43	ten	hearts	10
## 44	nine	hearts	9
## 45	eight	hearts	8
## 46	seven	hearts	7
## 47	six	hearts	6
## 48	five	hearts	5
## 49	four	hearts	4
## 50	three	hearts	3
## 51	two	hearts	2
## 52	ace	hearts	1

```
deck <- read.csv("../data/cards.csv")
str(deck)
```

```
## 'data.frame':   52 obs. of  3 variables:
## $ face : Factor w/ 13 levels "ace","eight",...: 6 8 5 11 7 2 9 10 3 4 ...
## $ suit : Factor w/ 4 levels "clubs","diamonds",...: 4 4 4 4 4 4 4 4 4 4 ...
## $ value: int   13 12 11 10 9 8 7 6 5 4 ...
```

```
deck <- read.csv("../data/cards.csv", stringsAsFactors = FALSE)
str(deck)
```

```
## 'data.frame':   52 obs. of  3 variables:
## $ face : chr  "king" "queen" "jack" "ten" ...
## $ suit : chr  "spades" "spades" "spades" "spades" ...
## $ value: int   13 12 11 10 9 8 7 6 5 4 ...
```

```
head(deck, n = 10)
```

```
##      face    suit value
## 1   king spades    13
## 2 queen spades    12
## 3   jack spades    11
## 4    ten spades    10
## 5   nine spades     9
## 6  eight spades     8
## 7 seven spades     7
## 8    six spades     6
## 9   five spades     5
## 10 four spades     4
```

Positive Integers

```
deck[1, 1]
```

```
## [1] "king"
```

```
deck[1, 1:3]
```

```
##      face    suit value
## 1 king spades    13
```

```
new <- deck[1, 1:3]
new
```

```
##      face    suit value
## 1 king spades    13
```

```
vec <- c(6, 1, 3, 6, 10, 5)
vec[1:3]
```

```
## [1] 6 1 3
```

```
vec[c(2, 4, 6)]
```

```
## [1] 1 6 5
```

```
str(deck[1, 1])
```

```
## chr "king"
```

```
str(deck[1, 1, drop = FALSE])
```

```
## 'data.frame': 1 obs. of 1 variable:  
## $ face: chr "king"
```

```
str(deck[1, 1:3])
```

```
## 'data.frame': 1 obs. of 3 variables:  
## $ face : chr "king"  
## $ suit : chr "spades"  
## $ value: int 13
```

```
str(deck[1:3, 1])
```

```
## chr [1:3] "king" "queen" "jack"
```

```
str(deck[1:3, 1, drop = FALSE])
```

```
## 'data.frame': 3 obs. of 1 variable:  
## $ face: chr "king" "queen" "jack"
```

```
## Negative Integers  
deck[-1, 1:3]
```

```
##      face      suit value
## 2 queen  spades    12
## 3  jack  spades    11
## 4   ten  spades    10
## 5   nine spades     9
## 6  eight spades     8
## 7   seven spades     7
## 8    six  spades     6
## 9   five  spades     5
## 10  four  spades     4
## 11 three  spades     3
## 12  two   spades     2
## 13 ace    spades     1
## 14 king   clubs    13
## 15 queen  clubs    12
## 16 jack   clubs    11
## 17  ten   clubs    10
## 18  nine  clubs     9
## 19 eight  clubs     8
## 20 seven  clubs     7
## 21  six   clubs     6
## 22  five  clubs     5
## 23  four  clubs     4
## 24 three  clubs     3
## 25  two   clubs     2
## 26 ace    clubs     1
## 27 king  diamonds  13
## 28 queen diamonds  12
## 29 jack  diamonds  11
## 30  ten  diamonds  10
## 31  nine diamonds   9
## 32 eight diamonds   8
## 33 seven diamonds   7
## 34  six  diamonds   6
## 35  five diamonds   5
## 36  four diamonds   4
## 37 three diamonds   3
## 38  two  diamonds   2
## 39 ace  diamonds    1
## 40 king  hearts    13
## 41 queen hearts    12
## 42 jack  hearts    11
## 43  ten  hearts    10
## 44  nine hearts     9
## 45 eight hearts     8
## 46 seven hearts     7
## 47  six  hearts     6
## 48  five hearts     5
## 49  four hearts     4
## 50 three hearts     3
## 51  two  hearts     2
## 52 ace   hearts     1
```

```
deck[-(2:52), 1:3]
```

```
##   face   suit value
## 1 king spades    13
```

Blank Spaces

```
deck[1, ]
```

```
##   face   suit value
## 1 king spades    13
```

```
deck[ , 1]
```

```
## [1] "king" "queen" "jack" "ten" "nine" "eight" "seven" "six" "five"
## [10] "four" "three" "two" "ace" "king" "queen" "jack" "ten" "nine"
## [19] "eight" "seven" "six" "five" "four" "three" "two" "ace" "king"
## [28] "queen" "jack" "ten" "nine" "eight" "seven" "six" "five" "four"
## [37] "three" "two" "ace" "king" "queen" "jack" "ten" "nine" "eight"
## [46] "seven" "six" "five" "four" "three" "two" "ace"
```

```
deck[ , 1, drop = FALSE]
```

```
##      face
## 1    king
## 2   queen
## 3    jack
## 4     ten
## 5    nine
## 6   eight
## 7   seven
## 8     six
## 9    five
## 10   four
## 11  three
## 12   two
## 13   ace
## 14   king
## 15  queen
## 16   jack
## 17   ten
## 18   nine
## 19  eight
## 20  seven
## 21   six
## 22   five
## 23   four
## 24  three
## 25   two
## 26   ace
## 27   king
## 28  queen
## 29   jack
## 30   ten
## 31   nine
## 32  eight
## 33  seven
## 34   six
## 35   five
## 36   four
## 37  three
## 38   two
## 39   ace
## 40   king
## 41  queen
## 42   jack
## 43   ten
## 44   nine
## 45  eight
## 46  seven
## 47   six
## 48   five
## 49   four
## 50  three
## 51   two
## 52   ace
```

Logical Values

```
deck[1, c(TRUE, TRUE, FALSE)]
```

```
##   face   suit  
## 1 king spades
```

```
rows <- c(TRUE, rep(FALSE, 51))  
deck[rows, ]
```

```
##   face   suit value  
## 1 king spades    13
```

Names

```
deck[1, c("face", "suit", "value")]
```

```
##   face   suit value  
## 1 king spades    13
```

```
deck[ , "value"]
```

```
##  [1] 13 12 11 10  9  8  7  6  5  4  3  2  1 13 12 11 10  9  8  7  6  5  4  3  2  
## [26]  1 13 12 11 10  9  8  7  6  5  4  3  2  1 13 12 11 10  9  8  7  6  5  4  3  
## [51]  2  1
```

```
deck[ , "value", drop = FALSE]
```



```
##      value
## 1      13
## 2      12
## 3      11
## 4      10
## 5       9
## 6       8
## 7       7
## 8       6
## 9       5
## 10      4
## 11      3
## 12      2
## 13      1
## 14      13
## 15      12
## 16      11
## 17      10
## 18       9
## 19       8
## 20       7
## 21       6
## 22       5
## 23       4
## 24       3
## 25       2
## 26       1
## 27      13
## 28      12
## 29      11
## 30      10
## 31       9
## 32       8
## 33       7
## 34       6
## 35       5
## 36       4
## 37       3
## 38       2
## 39       1
## 40      13
## 41      12
## 42      11
## 43      10
## 44       9
## 45       8
## 46       7
## 47       6
## 48       5
## 49       4
## 50       3
## 51       2
## 52       1
```

```
deal <- function(cards) {
  cards[1, ]
}
deal(deck)
```

```
##   face   suit value
## 1 king spades    13
```

```
deck2 <- deck[1:52, ]
head(deck2)
```

```
##   face   suit value
## 1 king spades    13
## 2 queen spades   12
## 3 jack spades    11
## 4 ten spades     10
## 5 nine spades     9
## 6 eight spades    8
```

```
deck2 <- deck[52:1, ]
head(deck2)
```

```
##   face   suit value
## 52 ace hearts     1
## 51 two hearts     2
## 50 three hearts   3
## 49 four hearts    4
## 48 five hearts    5
## 47 six hearts     6
```

```
deck3 <- deck[c(2, 1, 3:52), ]
head(deck3)
```

```
##   face   suit value
## 2 queen spades   12
## 1 king spades    13
## 3 jack spades    11
## 4 ten spades     10
## 5 nine spades     9
## 6 eight spades    8
```

```
random <- sample(1:52, size = 52)
random
```

```
## [1]  5 38 19 17 22 33 16 32 47  1 45  8 52 50 40 46 15 29 21 35  7  2 13 36 31
## [26] 37 27  6 42  9 26  4 39 24 25 23 12 41 34 10 20 51 30 11 48  3 49 43 18 44
## [51] 14 28
```

```
deck4 <- deck[random, ]
head(deck4)
```

```
##      face      suit value
## 5    nine    spades     9
## 38   two diamonds    2
## 19 eight     clubs     8
## 17   ten     clubs    10
## 22   five     clubs     5
## 33 seven diamonds    7
```

```
shuffle <- function(cards) {
  random <- sample(1:52, size = 52)
  cards[random, ]
}
deal(deck)
```

```
##      face      suit value
## 1 king spades     13
```

```
deck2 <- shuffle(deck)
deal(deck2)
```

```
##      face      suit value
## 19 eight clubs      8
```

Dollar Signs and Double Brackets

```
str(deck)
```

```
## 'data.frame':   52 obs. of  3 variables:
## $ face : chr  "king" "queen" "jack" "ten" ...
## $ suit : chr  "spades" "spades" "spades" "spades" ...
## $ value: int   13 12 11 10 9 8 7 6 5 4 ...
```

```
deck$value
```

```
## [1] 13 12 11 10 9 8 7 6 5 4 3 2 1 13 12 11 10 9 8 7 6 5 4 3 2
## [26] 1 13 12 11 10 9 8 7 6 5 4 3 2 1 13 12 11 10 9 8 7 6 5 4 3
## [51] 2 1
```

```
mean(deck$value)
```

```
## [1] 7
```

```
median(deck$value)
```

```
## [1] 7
```

```
lst <- list(numbers = c(1, 2), logical = TRUE, strings = c("a", "b", "c"))  
lst
```

```
## $numbers  
## [1] 1 2  
##  
## $logical  
## [1] TRUE  
##  
## $strings  
## [1] "a" "b" "c"
```

```
lst[1]
```

```
## $numbers  
## [1] 1 2
```

```
lst$numbers
```

```
## [1] 1 2
```

```
lst[[1]]
```

```
## [1] 1 2
```

```
lst["numbers"]
```

```
## $numbers  
## [1] 1 2
```

```
lst[["numbers"]]
```

```
## [1] 1 2
```