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)
```

```
##    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
```

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"
##  [9] "five"  "four"  "three" "two"   "ace"   "king"  "queen" "jack"
## [17] "ten"   "nine"  "eight" "seven" "six"   "five"  "four"  "three"
## [25] "two"   "ace"   "king"  "queen" "jack"  "ten"   "nine"  "eight"
## [33] "seven" "six"   "five"  "four"  "three" "two"   "ace"   "king"
## [41] "queen" "jack"  "ten"   "nine"  "eight" "seven" "six"   "five"
## [49] "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
## [24]  3  2  1 13 12 11 10  9  8  7  6  5  4  3  2  1 13 12 11 10  9  8  7
## [47]  6  5  4  3  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
```

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

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

```r
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
```

```r
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
```

```r
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
```

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

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

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

```
##       face    suit value
## 48   five  hearts     5
## 19  eight   clubs     8
## 15  queen   clubs    12
## 35   five diamonds    5
## 31   nine diamonds    9
## 4     ten  spades    10
```

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

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

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

```
##    face   suit value
## 42 jack hearts    11
```

Dollar Signs and Double Brackets

```r
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 ...
```

```r
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
## [24]  3  2  1 13 12 11 10  9  8  7  6  5  4  3  2  1 13 12 11 10  9  8  7
## [47]  6  5  4  3  2  1
```

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

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

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

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

```r
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"
```

```r
lst[1]
```

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

```r
lst$numbers
```

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

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

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

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

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

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

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