

MOOC Course - Introduction to R Software

July 2021

Assignment 4

1. Which one of the following is the correct outcome of the command

`sort(c(20,50, 10, 30, 90,70, 80), decreasing = FALSE)?`

a. 1 2 3 5 7 8 9

b. 9 8 7 5 3 2 1

c. 10 20 30 50 70 80 90

d. 90 80 70 50 30 20 10

Solution:

```
R Console
> sort(c(20,50, 10, 30, 90,70, 80), decreasing = FALSE)
[1] 10 20 30 50 70 80 90
> |
```

2. Which one of the following is the correct outcome of the command

`sort(c(20,50, 10, 30, 90,70, 80), increasing = TRUE) ?`

a. 10 20 30 50 70 80 90

b. 90 80 70 50 30 20 10

c. 1 2 3 5 7 8 9

d. Error...

Solution:

```
R Console
> sort(c(20,50, 10, 30, 90,70, 80), increasing = TRUE)
Error in sort.int(x, na.last = na.last, decreasing = decreasing, ...) :
  unused argument (increasing = TRUE)
> |
```

3. Which one of the following is the correct outcome of the command `order(c(20,50, 10, 30, 90,70, 80), decreasing = FALSE)?`

a. 1 2 3 4 5 6 7

b. 1 4 3 2 5 7 6

c. 3 1 4 2 6 7 5

d. 3 1 4 5 7 6 2

Solution:

```
R Console
> order(c(20,50, 10, 30, 90,70, 80), decreasing = FALSE)
[1] 3 1 4 2 6 7 5
> |
```

4. Which one of the following is the correct outcome of the command `mode(c(1, 2, "3", 8+9, "7+9", 6.7, 110*45))?`

a. character

b. numeric

c. list

d. data frame

Solution:

```
R Console
> mode(c(1, 2, "3", 8+9, "7+9", 6.7, 110*45))
[1] "character"
> |
```

5. Which one of the following is the correct outcome of the command `x[[2]]`

where

```
x <-list (c("name1", "name2"), seq(from=5, to=7), rep(8:10, each=2)) ?
```

a. 6

b. 99

c. 5 6 7

d. "name2"

Solution:

```
R Console
> x <-list (c("name1", "name2"), seq(from=5, to=7), rep(8:10, each=2))
> x[[2]]
[1] 5 6 7
> |
```

6. Which one of the following is the correct outcome of the command `x[[2]][2]`

where

```
x <-list (c("name1", "name2"), seq(from=5, to=7), rep(8:10, each=2))
each=2))
```

gives an output as

a. 5 6 7

b. 6

c. 99

d. "name2"

Solution:

```
R Console
> x <-list (c("name1", "name2"), seq(from=5, to=7), rep(8:10, each=2))
> x[[2]][2]
[1] 6
> |
```

7. Which one of the following is the correct outcome of the command `x[2][2]` where

```
x <-list (c("name1", "name2"), seq(from=5, to=7), rep(8:10, each=2)) ?
```

a. 5 6 7

b. 6

c. 99

d. "NULL"

Solution:

```
R Console
> x <-list (c("name1", "name2"), seq(from=5, to=7), rep(8:10, each=2))
> x[2][2]
[[1]]
NULL
> |
```

8. Which one of the following is the correct outcome of the command `x[[3]]` where

```
x <-list (c("name1", "name2"), seq(from=5, to=7), rep(8:10, each=2)) ?
```

a. 7

b. 8 8 9 9 10 10

c. 8 9 10 8 9 10

d. 10 10 9 9 8 8

Solution:

```
R Console
> x <-list (c("name1", "name2"), seq(from=5, to=7), rep(8:10, each=2))
> x[[3]]
[1] 8 8 9 9 10 10
> |
```

9. Which one of the following is the correct outcome of the command `x[(x>50)]` where

`x <- c(10, 75, 20, 35, 30, 40, 180, 50, 60, 27, 70, 67, 80, 50, 39, 120)` ?

a. 75 180 60 70 67 80 120

b. 10 20 35 30 40 27 39

c. TRUE

d. FALSE

Solution:

```
R Console
> x <- c(10, 75, 20, 35, 30, 40, 180, 50, 60, 27, 70, 67, 80, 50, 39, 120)
> x[(x>50)]
[1] 75 180 60 70 67 80 120
> |
```

10. Which one of the following is the correct outcome of the command

`x[(x - 20 > 40)]` where

`x <- c(10, 75, 20, 35, 30, 40, 180, 50, 60, 27, 70, 67, 80, 50, 39, 120)` ?

a. 10 20 35 30 40 50 27 50 39

b. 75 180 70 67 80 120

c. NULL

d. None of these

Solution:

```
R Console
> x <- c(10, 75, 20, 35, 30, 40, 180, 50, 60, 27, 70, 67, 80, 50, 39, 120)
> x[(x - 20 > 40)]
[1] 75 180 70 67 80 120
> |
```

11. Which one of the following is the correct outcome of the command

`x[(x^2 + 10 > 50)]` where

`x <- c(40, 25, 80, 45, 39, 43, 120, 20, 70, 87, 170, 167, 180, 150, 139, 120)` ?

a. 80 45 43 120 70 87 170 167 180 150 139 120

b. 75 180 70 67 80 120

c. 40 25 80 45 39 43 120 20 70 87 170 167 180 150 139 120

d. 80 120 70 87 170 167 180 150 139 120

Solution:

```
R Console
> x <- c(40, 25, 80, 45, 39, 43, 120, 20, 70, 87, 170, 167, 180, 150, 139, 120)
> x[(x^2 + 10 > 50)]
[1] 40 25 80 45 39 43 120 20 70 87 170 167 180 150 139 120
> |
```

12. If `y <- 10:20` then which one of the following is the correct outcome of the command `y[-(1:9)]` ?

a. -19 -20

b. 19 20

c. 10 11 12 13 14 15 16 17 18

d. -10 -11 -12 -13 -14 -15 -16 -17 -18

Solution:

```
R Console
> y <- 10:20
> y[-(1:9)]
[1] 19 20
> |
```

13. Consider the list `z <- list(x1 = "name1", x2 = 10:15)`. Which of the following is the correct command to change the element `x2` by `y2`?

- a. `names(z)[2] = y2`
- b. `names(z)[2] = "y2"`
- c. `change.names(z)[2] = "y2"`
- d. `name.change(z)[2] = "y2"`

Solution:

```
R Console
> z <- list(x1 = "name1", x2 = 10:15)
> z
$x1
[1] "name1"

$x2
[1] 10 11 12 13 14 15

> names(z)[2] = "y2"
> z
$x1
[1] "name1"

$y2
[1] 10 11 12 13 14 15

> |
```

14. Consider the list `z <-list(x1 = "name1", x2 = 10:15)`. Which one of the following is the correct outcome of the command `z["x2"]` ?

- a. `[1] "name1"`
- b. `[1] "10:15"`
- c. `[1] 15 14 13 12 11 10`
- d. `[1] 10 11 12 13 14 15`

Solution:

```
R Console
> z <-list(x1 = "name1", x2 = 10:15)
> z["x2"]
$x2
[1] 10 11 12 13 14 15

> |
```

15. Which one of the following is the correct outcome of the command `factor(c(1,1,2,2,3,3))`?

a.

```
[1] 1 1 2 2 3 3  
Levels: 1 2 3
```

b.

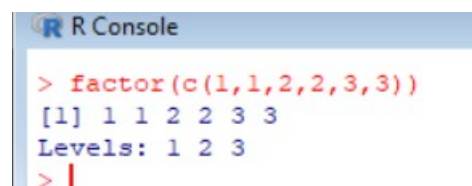
```
[1] 1 2 3  
Levels: 1 2 3
```

c.

```
[1] 1 2 3  
Levels: 1 1 2 2 3 3
```

d. None

Solution:



```
R Console  
> factor(c(1,1,2,2,3,3))  
[1] 1 1 2 2 3 3  
Levels: 1 2 3  
> |
```


16. Which one of the following is the correct outcome of the following commands?

```
data = c(1,1,2,2,3,3)
factor(data)
levels(data) = c('I','II','III')
data
```

a.

```
[1] 1 1 2 2 3 3
attr(,"levels")
[1] "I" "II" "III"
```

b.

```
[1] 1 2 3
attr(,"levels")
[1] "I" "II" "III"
```

c.

```
[1] I I II II III III
Levels: 1 2 3
```

d. None of these

Solution:

```
R Console
> data = c(1,1,2,2,3,3)
> factor(data)
[1] 1 1 2 2 3 3
Levels: 1 2 3
> levels(data) = c('I','II','III')
> data
[1] 1 1 2 2 3 3
attr(,"levels")
[1] "I" "II" "III"
> |
```

17. Which one of the following is the correct outcome of the command

`factor(c(1,2,2,5,1,2,1,5),levels=c(1,2,5),ordered=TRUE)` ?

a.

```
[1] 1 < 2 < 5
```

```
Levels: 1 2 2 5 1 2 1 5
```

b.

```
[1] 1 2 5
```

```
Levels: 1 2 2 5 1 2 1 5
```

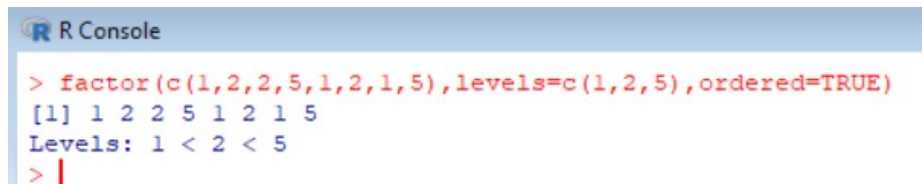
c.

```
[1] 1 2 2 5 1 2 1 5
```

```
Levels: 1 < 2 < 5
```

d. None of these

Solution:



```
R Console
> factor(c(1,2,2,5,1,2,1,5),levels=c(1,2,5),ordered=TRUE)
[1] 1 2 2 5 1 2 1 5
Levels: 1 < 2 < 5
> |
```

18. Which one is the correct outcome of the command

`factor(c(rep("male",2), rep("female", 3)))` ?

a.

```
[1] female  female  female male male  
Levels: female male
```

b.

```
[1] female  female  male male male  
Levels: female male
```

c.

```
[1] male  male  male female female  
Levels: female male
```

d.

```
[1] male  male  female female female  
Levels: female male
```

Solution:

```
R Console  
> factor( c(rep("male",2), rep("female", 3)))  
[1] male  male  female female female  
Levels: female male  
> |
```

19. Which one of the following is the correct outcome of the command

```
unclass(factor( c("lemonade", "juice", "water", "juice",  
"lemonade"), levels=c("juice", "lemonade", "water") )) ?
```

a.

```
[1] 2 1 3 1 2  
attr(,"levels")  
[1] "juice" "lemonade" "water"
```

b.

```
[1] 2 3 1 3 2  
attr(,"levels")  
[1] "juice" "lemonade" "water"
```

c.

```
[1] 2 1 3 1 2  
attr(,"levels")  
[1] "lemonade" "juice" "water"
```

d.

```
[1] 1 3 2 3 1  
attr(,"levels")  
[1] "lemonade" "juice" "water"
```

Solution:

```
R Console  
> unclass(factor( c("lemonade", "juice", "water", "juice", "lemonade"), levels=c("juice", "lemonade", "water") ))  
[1] 2 1 3 1 2  
attr(,"levels")  
[1] "juice" "lemonade" "water"  
> |
```

20. Which one of the following is the correct outcome of the command

`as.factor(c(1, 2, 2, 3, 3, 3)) ?`

a.

```
[1] 1 2 3  
Levels: 1 2 3
```

b.

```
[1] 3 2 2 1 1 1  
Levels: 1 2 3
```

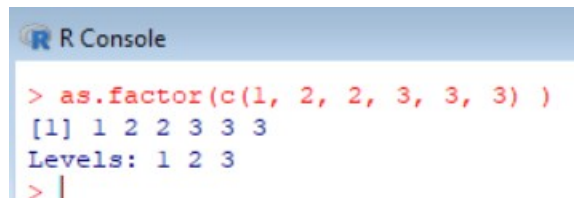
c.

```
[1] 1 2 2 3 3 3  
Levels: 1 2 3
```

d.

```
[1] 1 2 2 3 3 3  
Levels: 3 2 1
```

Solution:



```
R Console  
> as.factor(c(1, 2, 2, 3, 3, 3) )  
[1] 1 2 2 3 3 3  
Levels: 1 2 3  
> |
```

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Answers of Assignment 4

1. c
2. d
3. c
4. a
5. c
6. b
7. d
8. b
9. a
10. b
11. c
12. b
13. b
14. d
15. a
16. a
17. d
19. a
20. c