MOOC Course - Introduction to R Software

July 2021

Assignment 3

1. If `x = 123` then which one of the following is the correct value of `y` after executing the command

```
y=if ( x==33 ) { x <- x^2 } else { x <- x^3 }
```
?

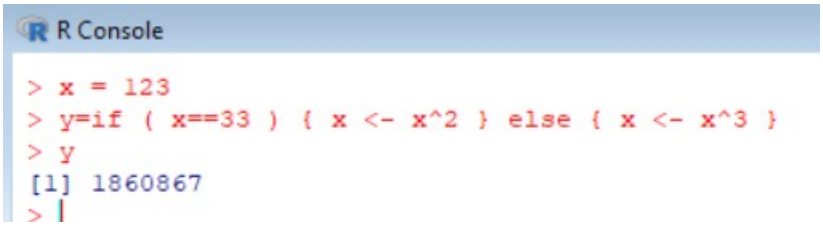
a. `1860867`

b. `15129`

c. `123`

d. None of these

Solution:



2. Which one of the following is the correct syntax to compute *y* for the following function?

$$y = \begin{cases} 2x^2 + |x-6| & \text{if} \quad x \le 0 \\ 3x^3 - \sqrt{x^5} & \text{if} \quad x > 0 \end{cases}$$

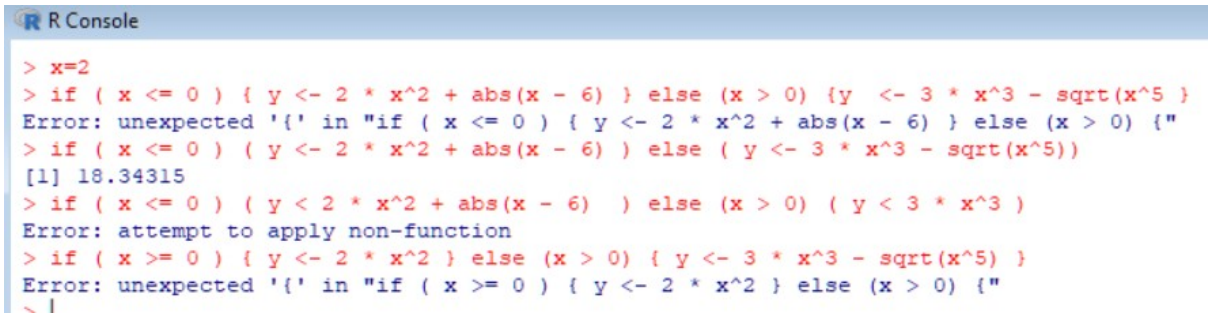
a. `if ( x <= 0 ) { y <- 2 * x^2 + abs(x - 6) } else (x > 0) {y <- 3 * x^3 - sqrt(x^5 }`

b. `if ( x <= 0 ) ( y <- 2 * x^2 + abs(x - 6) ) else ( y <- 3 * x^3 - sqrt(x^5))`

c. `if ( x <= 0 ) ( y < 2 * x^2 + abs(x - 6) ) else (x > 0) ( y < 3 * x^3 )`

d. `if ( x >= 0 ) { y <- 2 * x^2 } else (x > 0) { y <- 3 * x^3 - sqrt(x^5) }`

Solution:



3. Suppose `x = c(2,4,6,8,10)` then which one of the following is the correct output of `ifelse(x<6, 2*x, 10*x)` ?

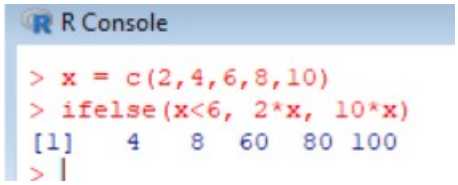
a. `20 40 12 16 20`

b. `20 40 60 80 100`

c. `4 8 12 16 20`

d. `4 8 60 80 100`

Solution:



4. Which one of the following is the correct outcome of

`for(i in 2:4) {print(1 + 2i)}` ?

a. `5 9 7`

b.

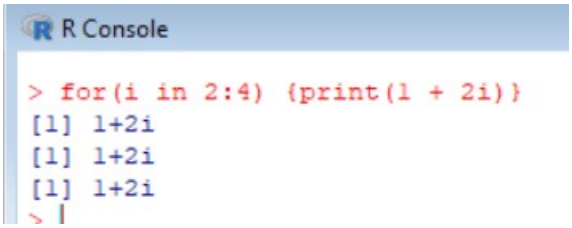
```
[1] 1

[1] 2i

[1] 1+2i
```

c.

```
[1] 1+2i

[1] 1+2i

[1] 1+2i
```

d. `Error...`

Solution:



5. Which one of the following is the correct outcome of

`for(i in 20:24) {print(i + 2*i)}` ?

a.

```
[1] i+2i

[1] i+2i

[1] i+2i

[1] i+2i

[1] i+2i
```

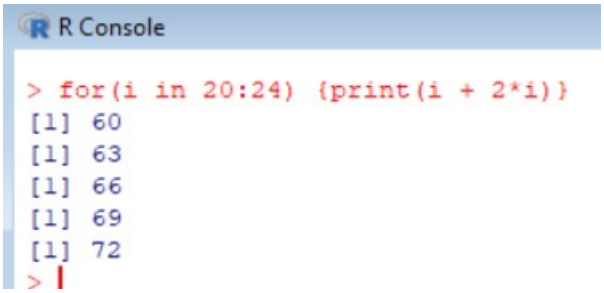
b.

```
[1] 60

[1] 63

[1] 66

[1] 69

[1] 72
```

c. **Error...**

d. None of these

Solution:



6. Which one of the following is the correct outcome of the following commands about while loop?

```
z <- 3

while (z < 15) {
   print(c("R Course","is helpful."))
   z = z + 2
   print(c("R Course","is not helpful."))
   z = z + 1
}
```

a.

```
[1] "R Course"         "is not helpful."
[1] "R Course"     "is helpful."
[1] "R Course"         "is not helpful."
[1] "R Course"     "is helpful."
[1] "R Course"         "is not helpful."
[1] "R Course"     "is helpful."
[1] "R Course"         "is not helpful."
[1] "R Course"     "is helpful."
```

b.

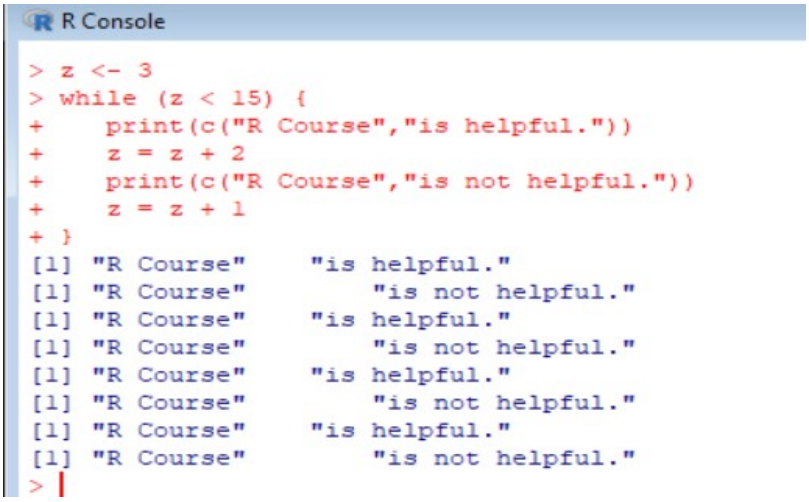
```
[1] "R Course"    "is helpful."  "R Course"        "is not
helpful." "R Course"    "is helpful."  "R Course"        "is
not helpful."  "R Course"    "is helpful."  "R Course"
"is not helpful."  "R Course"    "is helpful."  "R Course"
"is not helpful."
```

c.

```
[1] "R Course"    "is helpful."
[1] "R Course"         "is not helpful."
[1] "R Course"    "is helpful."
[1] "R Course"         "is not helpful."
[1] "R Course"    "is helpful."
[1] "R Course"         "is not helpful."
[1] "R Course"    "is helpful."
[1] "R Course"         "is not helpful."
```

d. None of these

Solution:



7. Which one of the following is the correct outcome of the following while loop?

```
x <- 10
while(x < 50) {x <- x+10; if (x == 40) break; print(x^2); }
```

a.

```
[1] 400
[1] 900
```

b.

```
[1] 1600
[1] 2500
```

c.

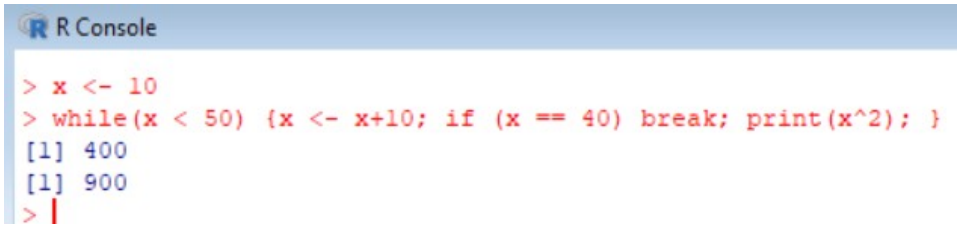
```
[1] 20
[1] 30
```

d.

```
[1] 20
[1] 30
[1] 40
```

```
[1] 50
```

Solution:



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

`abs(seq(-2,2))`?

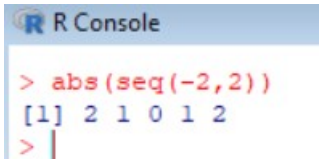
a. `2 1 0 1 2`

b. `0 1 2`

c. `-2 -1 0 1 2`

d. None of these

Solution:



9. Which one of the following is the correct output of the command

`sqrt(abs(seq(-6,6, by = 3)))` ?

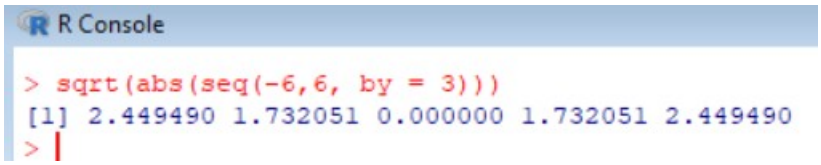
a. `0.000000 1.732051 2.449490`

b. `2.449490 1.732051 0.000000 1.732051 2.449490`

c. `-2.449490 -1.732051 0.000000 1.732051 2.449490`

d. None of these

Solution:



10. Which one of the following is the correct output of the command `seq(18,-18, by = -5)`?

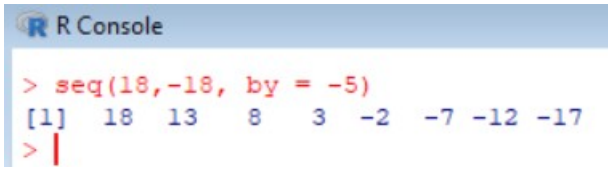
a. `-17 -12 -7 -2 3 8 13 18`

b. `-17 -12 -7 -3 3 7 12 17`

c. `17 12 7 3 -3 -7 -12 -17`

d. `18 13 8 3 -2 -7 -12 -17`

Solution:



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

`seq(to = 100, length = 8)`?

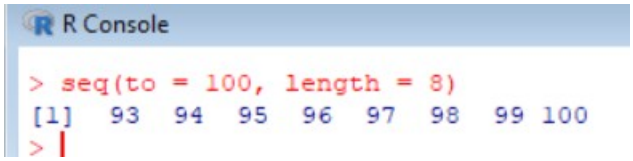
a. `30 40 50 60 70 80 90 100`

b. `93 94 95 96 97 98 99 100`

b. `100 99 98 97 96 95 94 93`

d. `101 102 103 104 105 106 107 108`

Solution:



12. Which one of the following is the correct output of the command `seq(to = -20, length = 10)` ?

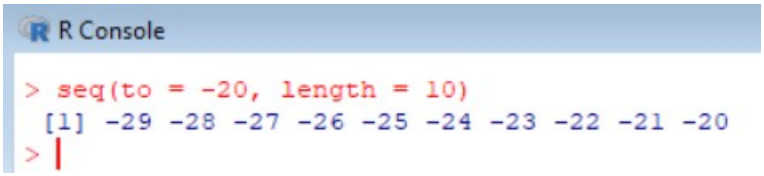
a. `-29 -28 -27 -26 -25 -24 -23 -22 -21 -20`

b. `-20 -21 -22 -23 -24 -25 -26 -27 -28 -29`

c. `20 21 22 23 24 25 26 27 28 29`

d. None of these

Solution:



13. Which one of the following is the correct output of the command

`seq(to = 22, length = 5, by = 6)` ?

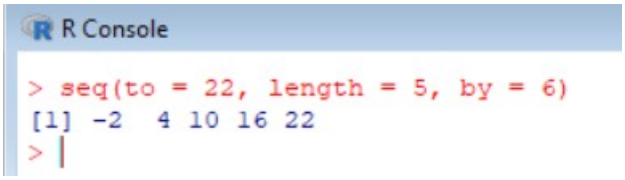
a. `2 4 10 16 22`

b. `22 16 10 4 2`

c. `-2 4 10 16 22`

d. None of these

Solution:



14. Which one of the following is the correct output of the command

```
seq(from = -10, length = 5, by = -0.3)
```
?

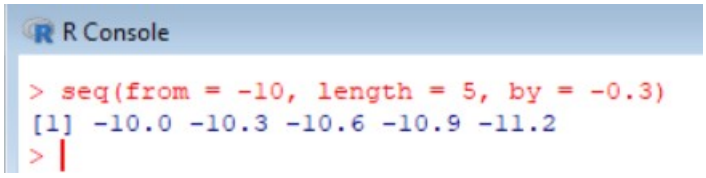
a. `-11.2 -10.9 -10.6 -10.3 -10.0`

b. `-10.0 -10.3 -10.6 -10.9 -11.2`

c. `10.0 10.3 10.6 10.9 11.2`

d. `11.2 10.9 10.6 10.3 10.0`

Solution:



15. Which one of the following is the correct output of `x` for the following commands

```
Y <- c(90, 77, 51, 20, 30, 60, 89)
X <- seq(along = Y)
```
?

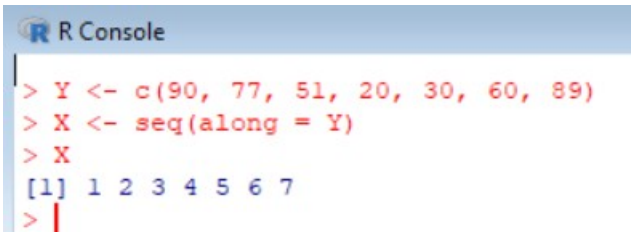
a. `1 2 3 4 5 6 7`

b. `7 5 3 1 2 4 6`

c. `7 6 5 4 3 2 1`

d. None of these

Solution:



16. Which one of the following is the correct output of `Y[X[2]]` and `Y[X[6]]` for the command

```
Y <- c(900, 717, 251, 280, 302, 670, 897)
X <- seq(along = Y)
```
?

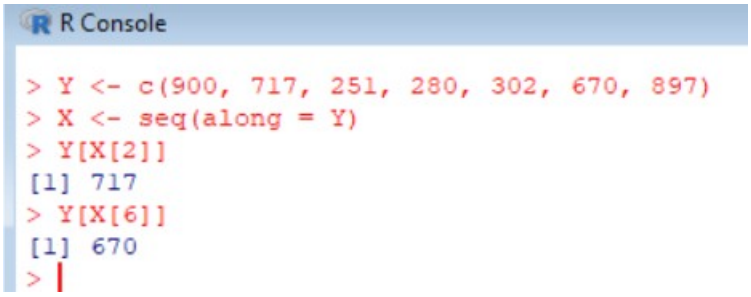
a. `3` and `4` respectively.

b. `4` and `3` respectively.

c. `670` and `717` respectively.

d. `717` and `670` respectively.

Solution:



17. Which one of the following is the correct command to generate a sequence of three yearly dates 1-Jan-2015, 1-Jan-2016 and 1-Jan-2017?

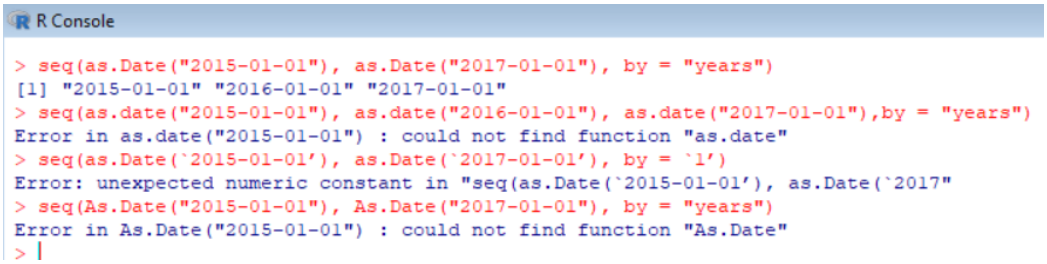
a. `seq(as.Date("2015-01-01"), as.Date("2017-01-01"), by = "years")`

b. `seq(as.date("2015-01-01"), as.date("2016-01-01"), as.date("2017-01-01"),by = "years")`

c. `seq(as.Date(`2015-01-01'), as.Date(`2017-01-01'), by = `1')`

d. `seq(As.Date("2015-01-01"), As.Date("2017-01-01"), by = "years")`

Solution:



18. Which one of the following is the correct command to generate the dates of 9 consecutive months starting from 5 Jan 2021?

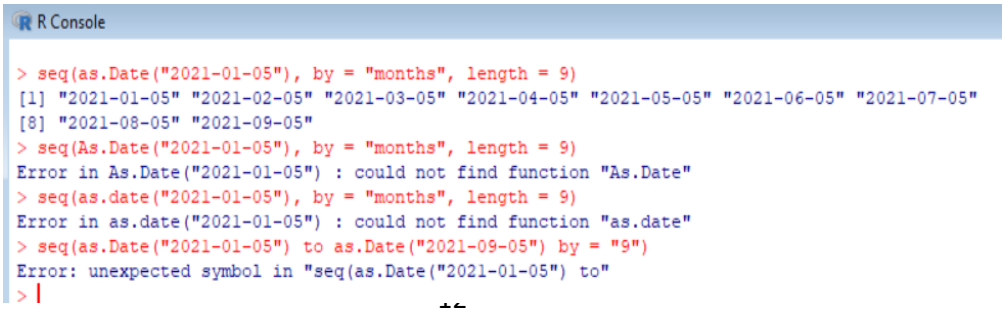
a. `seq(As.Date("2021-01-05"), by = "months", length = 9)`

b. `seq(as.date("2021-01-05"), by = "months", length = 9)`

c. `seq(as.Date("2021-01-05"), by = "months", length = 9)`

d. `seq(as.Date("2021-01-05") to as.Date("2021-09-05") by = "9")`

Solution:



19. Which one of the following is the correct outcome of the command `letter[1:3]` ?

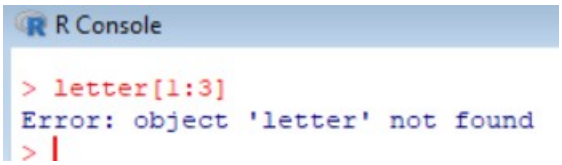
a. `"a" "b" "c"`

b. `"A" "B" "C"`

c. `"4" "5"`

d. `Error...`

Solution:



20. Which one of the following is the correct outcome of the command `LETTERS[18:12]` ?

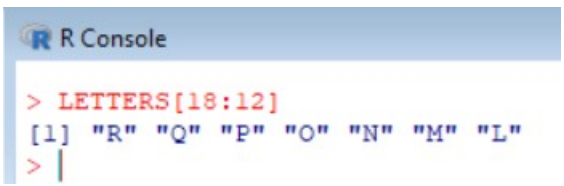
a. `"r" "q" "p" "o" "n" "m" "l"`

b. `"R" "Q" "P" "O" "N" "M" "L"`

c. `"L" "M" "N" "O" "P" "Q" "R"`

d. `Error...`

Solution:



21. Which one of the following is the correct outcome of the command `rep(2:5,4)`?

a. `2 2 2 2 3 3 3 3 4 4 4 4 5 5 5 5`

b. `2 3 3 4 4 4 5 5 5 5`

c. `2 3 4 5 2 3 4 5 2 3 4 5 2 3 4 5`

d. `2:5 2:5 2:5 2:5`

Solution:

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

`rep(70:65, times=3)` ?

a. `70 69 68 67 66 65 70 69 68 67 66 65 70 69 68 67 66 65`

b. `65 66 67 68 69 70 65 66 67 68 69 70 65 66 67 68 69 70`

c. `70 69 68 67 66 65 65 66 67 68 69 70 70 69 68 67 66 65`

d. `65 66 67 68 69 70 70 69 68 67 66 65 65 66 67 68 69 70`

Solution:

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

`rep(20:25, each=3)` ?

a. `20 21 22 23 24 25 20 21 22 23 24 25 20 21 22 23 24 25`

b. `20 20 20 21 21 21 22 22 22 23 23 23 24 24 24 25 25 25`

c. `20:25 20:25 20:25`

d. `25 25 25 24 24 24 23 23 23 20 20 20 22 22 22 21 21 21`

Solution:

24. Which one of the following is the correct outcome of the commands

```
x <- matrix(nrow=2, ncol=2, data=1:4, byrow=T)
rep(x, each=3)
```

?

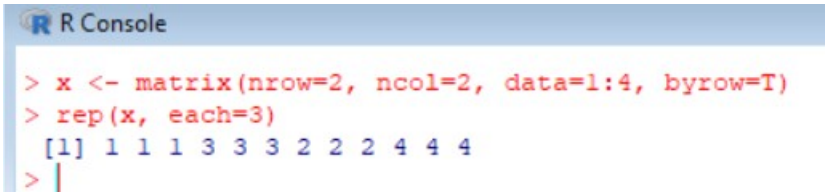
a. `1 1 1 4 4 4 3 3 3 2 2 2`

b. `1 1 1 3 3 3 2 2 2 4 4 4`

c. `1 2 3 4 1 2 3 4 1 2 3 4`

d. None of these

Solution:



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

`rep(c("name1", "name2", "name3"), each=2)` ?

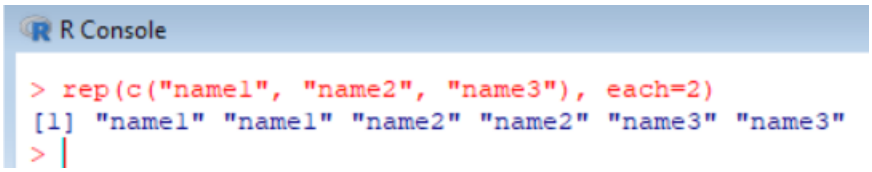
a. `"name1" "name1" "name2" "name2" "name3" "name3"`

b. `"name1" "name2" "name3" "name1" "name2" "name3"`

c. `name 1 2 3 name 1 2 3`

d. `name 1 1 name 2 2 name 3 3`

Solution:



MOOC Course - Introduction to R Software

Answers of Assignment 3

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

16. d
17. a
18. c
19. d
20. b
21. c
22. a
23. b
24. b
25. a