MOOC Course - Introduction to R Software

July 2021

Assignment 8

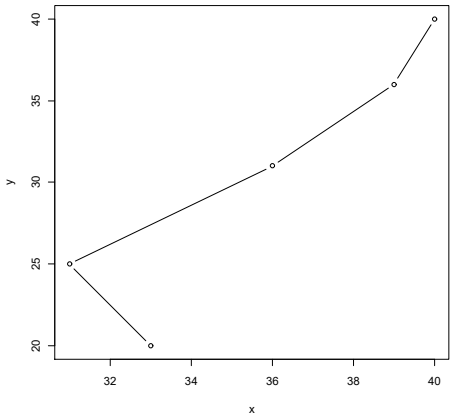
1. Which one of the following is the correct command to obtain the scatter plot of the following type in R for the given data `x = c(33,31,36,39,40), y = c(20,25,31,36,40)`?

a. `plot(x,y, "l")`

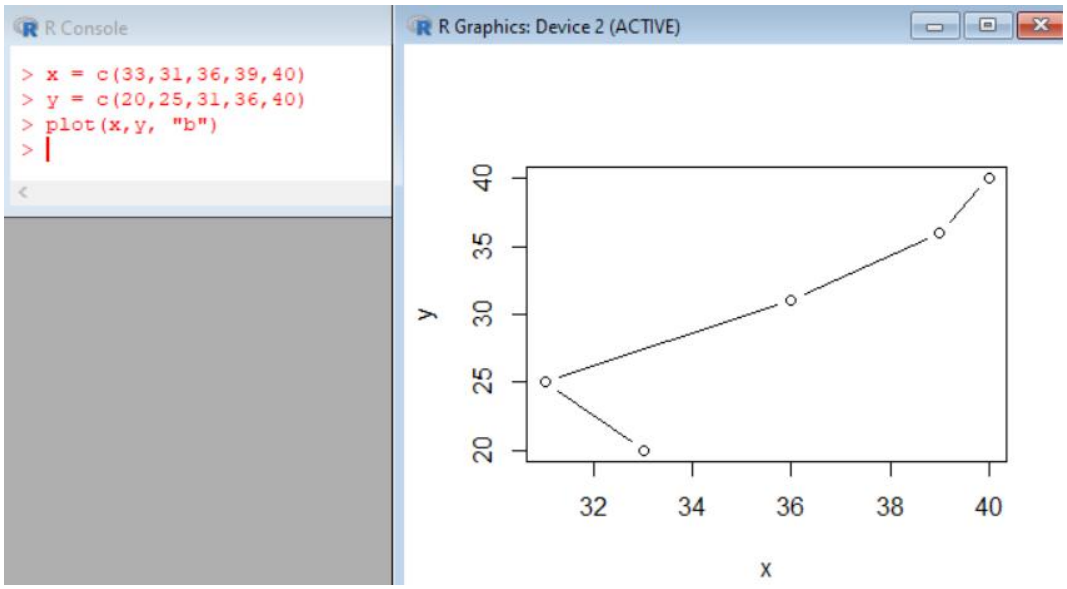
b. `plot(x,y, "s")`

c. `plot(x,y, "h")`

d. `plot(x,y, "b")`



Solution:



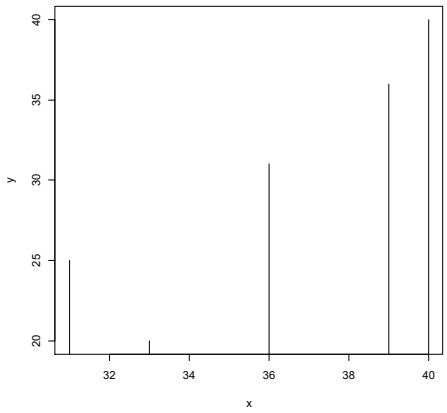
2. Which one of the following is the correct command to obtain the scatter plot of the following type in R for the given data `x = c(33,31,36,39,40), y = c(20,25,31,36,40)` ?

a. `plot(x,y, "l")`

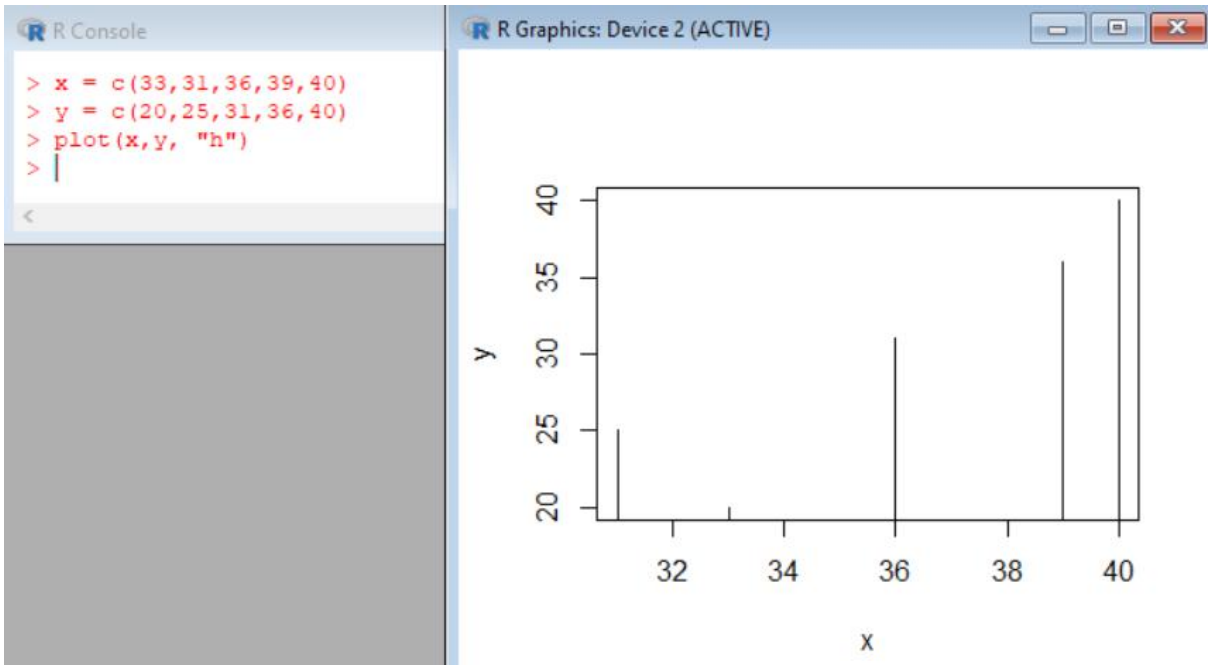
b. `plot(x,y, "h")`

c. `plot(x,y, "s")`

d. `plot(x,y, "b")`



Solution:



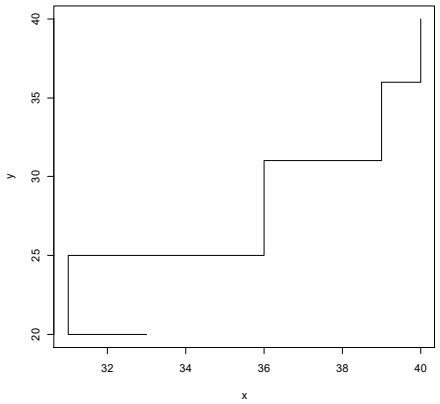
3. Which one of the following is the correct command to obtain the scatter plot of the following type in R for the given data `x = c(33,31,36,39,40), y = c(20,25,31,36,40)` ?

a. `plot(x,y, "h")`

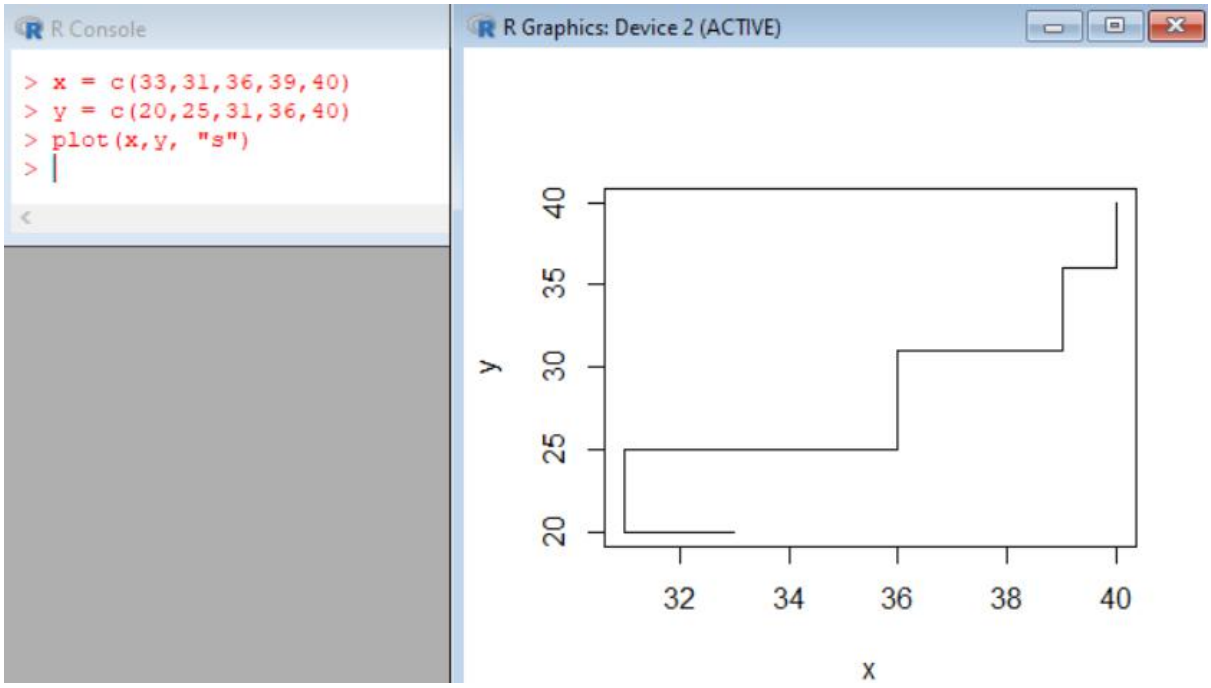
b. `plot(x,y, "l")`

c. `plot(x,y, "s")`

d. `plot(x,y, "b")`



Solution:



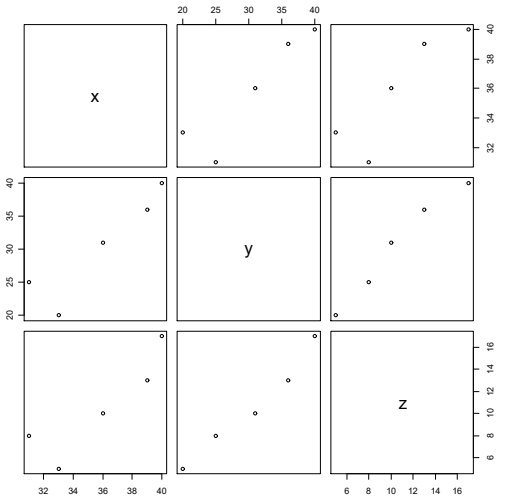
4. Which one of the following is the correct command to obtain the scatter plot of the following type in R for the given data `x = c(33,31,36,39,40), y = c(20,25,31,36,40)` and `z = c(5,8,10,13,17)` ?

a. `plots(cbind(x,y,z))`

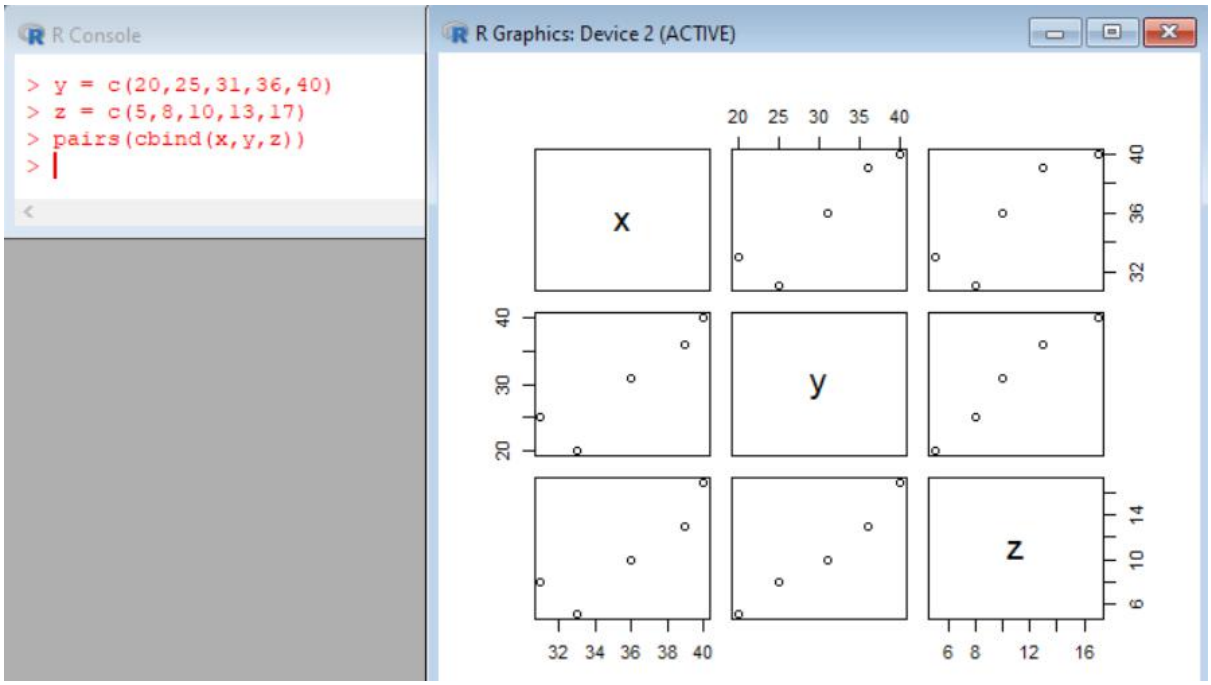
b. `plot(c(x,y,z))`

c. `pairs(c(x,y,z))`

d. `pairs(cbind(x,y,z))`



Solution:



5. The covariance between the following data

`x = (33,31,36,39,40), y = (20,25,31,36,40)` is correctly obtained by which of the following command in R?

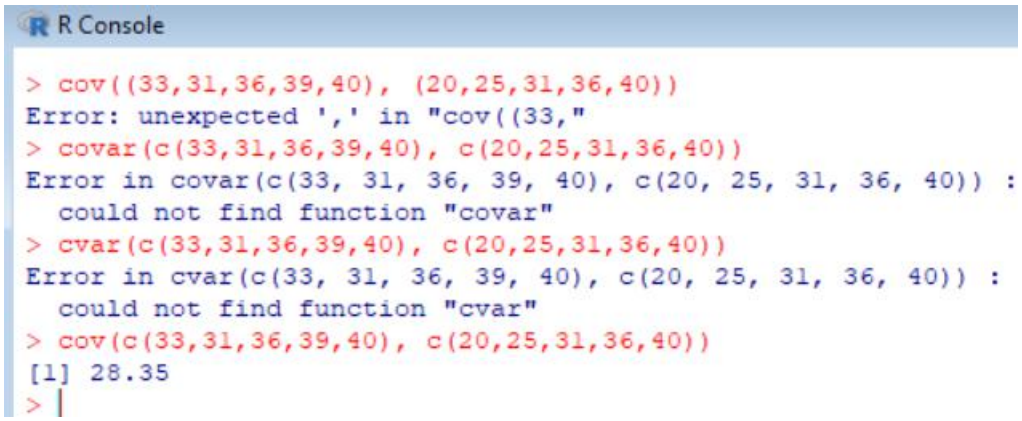
a. `cov((33,31,36,39,40), (20,25,31,36,40))`

b. `cov(c(33,31,36,39,40), c(20,25,31,36,40))`

c. `covar(c(33,31,36,39,40), c(20,25,31,36,40))`

d. `cvar(c(33,31,36,39,40), c(20,25,31,36,40))`

Solution:



6. The correlation between the following data `x = (33,31,36,39,40), y = (20,25,31,36,40)` is correctly obtained by which of the following command in R?

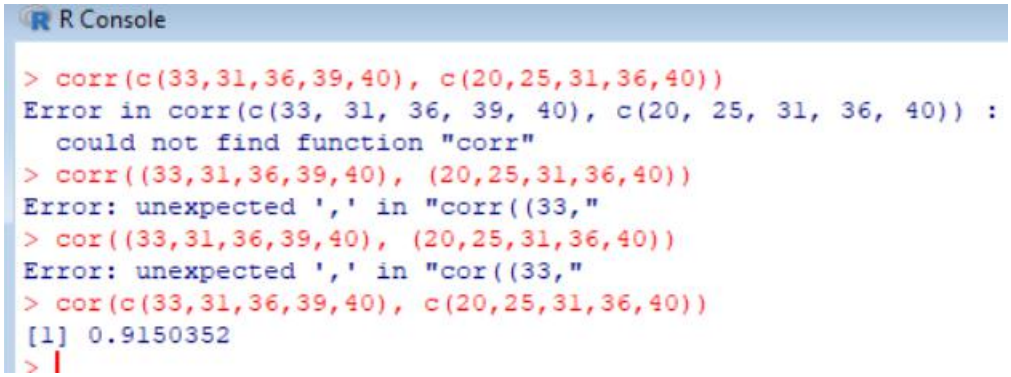
a. `corr(c(33,31,36,39,40), c(20,25,31,36,40))`

b. `corr((33,31,36,39,40), (20,25,31,36,40))`

c. `cor(c(33,31,36,39,40), c(20,25,31,36,40))`

d. `cor((33,31,36,39,40), (20,25,31,36,40))`

Solution:



7. The following data are the claims (in millions of Rupees) for health insurance from 8 different companies along with their surplus from received insurance premium (in millions of Rupees). Which one of the following correctly specify the command to obtain the covariance between the claim and surplus from received premium and its value?

Company	**Claims**	**Surplus**
Company 1	1,425	277
Company 2	273	100
Company 3	915	120
Company 4	1,687	259
Company 5	234	40
Company 6	142	25
Company 7	259	57
Company 8	258	31

a.

`cov(c(1,425,273,915,1,687,234,142,259,258),c(277,100,120,259,40,25,57,31))` and `59196.34` respectively.

b.

`cov(c(1425,273,915,1687,234,142,259,258),c(277,100,120,259,40,25,57,31))` and `59196.34` respectively.

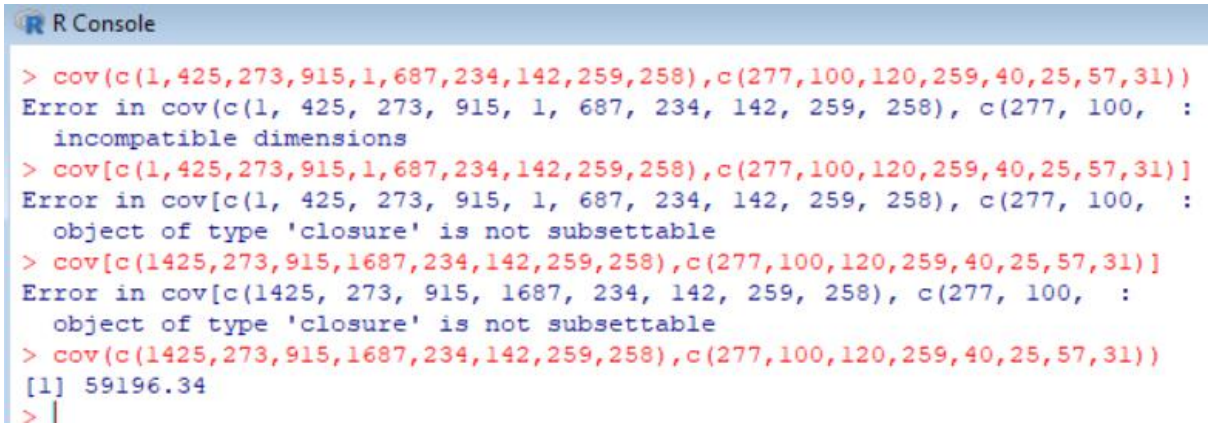
c.

`cov[c(1,425,273,915,1,687,234,142,259,258),c(277,100,120,259,40,25,57,31)]` and `5916.34` respectively.

d.

`cov[c(1425,273,915,1687,234,142,259,258),c(277,100,120,259,40,25,57,31)]` and `5916.34` respectively.

Solution:



8. The following data are the claims (in millions Rupees) for health insurance from 8 different companies along with their surplus from received insurance premium (in millions Rupees) . Which one of the following correctly specify the command to obtain the correlation coefficient between the claim and surplus from received premium and its value?

Company	**Claims**	**Surplus**
Company 1	1425	277
Company 2	273	100
Company 3	915	120
Company 4	1687	259
Company 5	234	40
Company 6	142	25
Company 7	259	57
Company 8	258	31

a. `cor(c(1425,273,915,1687,234,142,259,258),c(277,100,120,259,40,25,57,31))` and `0.9572336` respectively.

b.

`cor(c(1,425,273,915,1,687,234,142,259,258),c(277,100,120,259,40,25,57,31))` and `0.9572336` respectively.

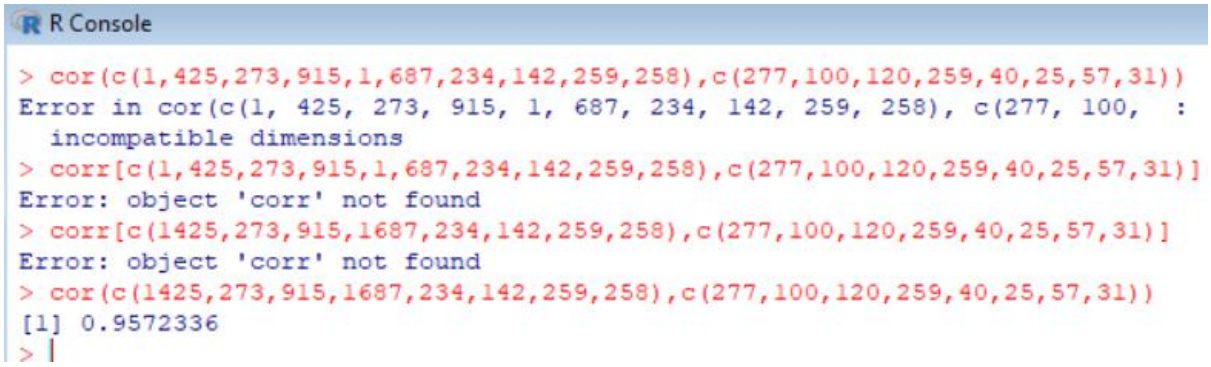
c.

`corr[c(1,425,273,915,1,687,234,142,259,258),c(277,100,120,259,40,25,57,31)]` and `0.857236` respectively.

d.

`corr[c(1425,273,915,1687,234,142,259,258),c(277,100,120,259,40,25,57,31)]` and `0.857236` respectively.

Solution:



9. Which one of the following is the correct function to obtain the square root of the sum of cubes of two numbers?

a.

```
cubsqrt <- function(x, y) {
   res1 <- x^3 + y^3
   res2 <- sqrt(res1)
   print{paste("The value of", x, "cube plus", y, "cube is",
res1, "cube and its square root is", res2)}
}
```

b.

```
cubsqrt <- function(x, y) [
   res1 <- x^3 + y^3
   res2 <- sqrt(res1)
   print(paste("The value of", x, "cube plus", y, "cube is",
res1, "cube and its square root is", res2))
]
```

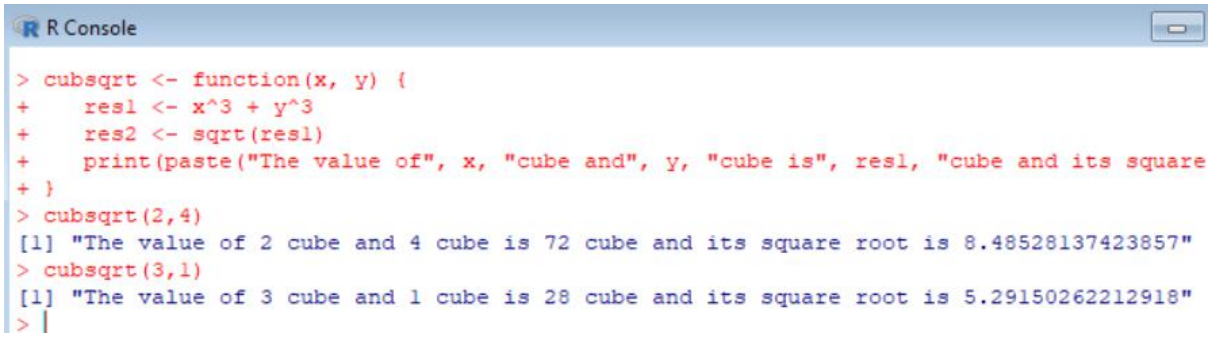
c.

```
cubsqrt <- function(x, y) {
   res1 <- x^3 + y^3
   res2 <- sqrt(res1)
   print(paste("The value of", x, "cube plus", y, "cube is",
res1, "and its square root is", res2))
}
```

d.

```
cubsqrt <- function(x, y) {
   res1 <- x^3 + y^3
   res2 <- sqrt(res1)
   print{paste{"The value of", x, "cube plus", y, "cube is",
res1, "and its square root is", res2}}
}
```

Solution:



10. Which one of the following is the correct code to obtain the value of following function on the basis of given data values of $x = (x_1, x_2,..., x_n)$ and $y = (y_1, y_2,..., y_n)$:

$$f(x,y)\frac{\sum_{i=1}^{n}\left(\frac{x_i}{y_i}\right)^4}{\sqrt[3]{\sum_{i=1}^{n}\left(\frac{x_i}{y_i}\right)^4}+\log\left(\sum_{i=1}^{n}\left(\frac{x_i}{y_i}\right)^4\right)^{1/5}}$$

a.

```
x=c(x1,x2,...,xn)
y=c(y1,y2,...,yn)

g <-  function(x,y)
{
  n <- length(x)
  z <- 0
  for (i in 1:n)
  (
    z[i] <- (x[i]/y[i])^4
  )
  sum(z)
}

f<-function()
{
fxy <- g(x,y)/g(x,y)^(1/3) + (log(g(x,y)))^(1/5)
fxy
}
```

b.

```
x=c(x1,x2,...,xn)
y=c(y1,y2,...,yn)

g <-  function(x,y)
{
  n <- length(x)
  z <- 0
  for (i in 1:n)
  {
    z[i] <- (x[i]/y[i])^4
  }
  sum(z)
}

f<-function()
{
fxy <- g(x,y)/(g(x,y)^(1/3) + (log(g(x,y)))^(1/5))
```

```
fxy
}
```

c.

```
x=c(x1,x2,...,xn)
y=c(y1,y2,...,yn)

g <-  function(x,y)
{
  n <- length(x)
  z <- 0
  for (i in 1:n)
  {
    z[i] <- (x[i]/y[i])^4
  }
  sum(z)
}

f<-function()
{
fxy <- g(x,y)^2/g(x,y)^(1/3) + (log(g(x,y)))^(1/5)
fxy
}
```

d.

```
x=c(x1,x2,...,xn)
y=c(y1,y2,...,yn)

g <-  function(x,y)
[
  n <- length(x)
  z <- 0
  for (i in 1:n)
  {
    z[i] <- (x[i]/y[i])^4
  }
  sum(z)
]

f<-function()
[
fxy <- g(x,y)^2/(g(x,y)^(1/3) + (log(g(x,y)))^(1/5))
fxy
]
```

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Answers of Assignment 8

1. d
2. b
3. c
4. d
5. b
6. c
7. b
8. a
9. c
10. b