

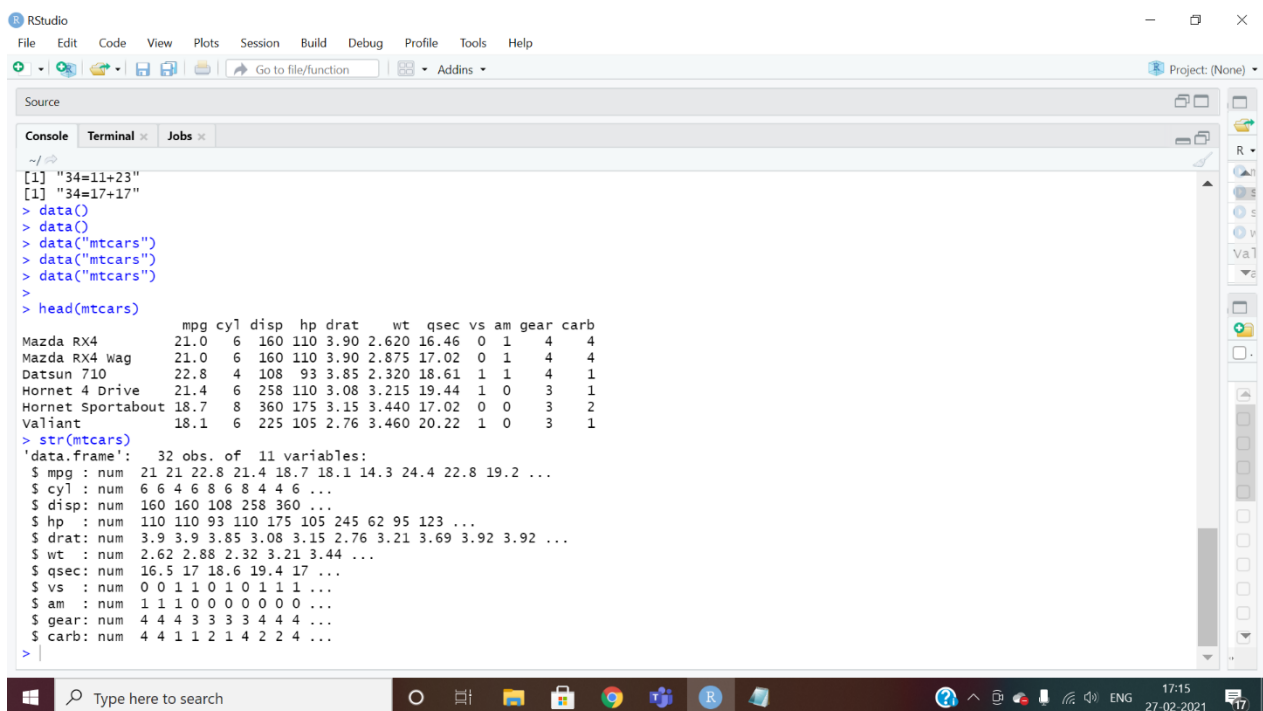
In this study , we will use mtcars datasets.

Q1)Print the strcture of the dataset

Answer:

```
data("mtcars")  
head(mtcars)  
str(mtcars)
```

OUTPUT



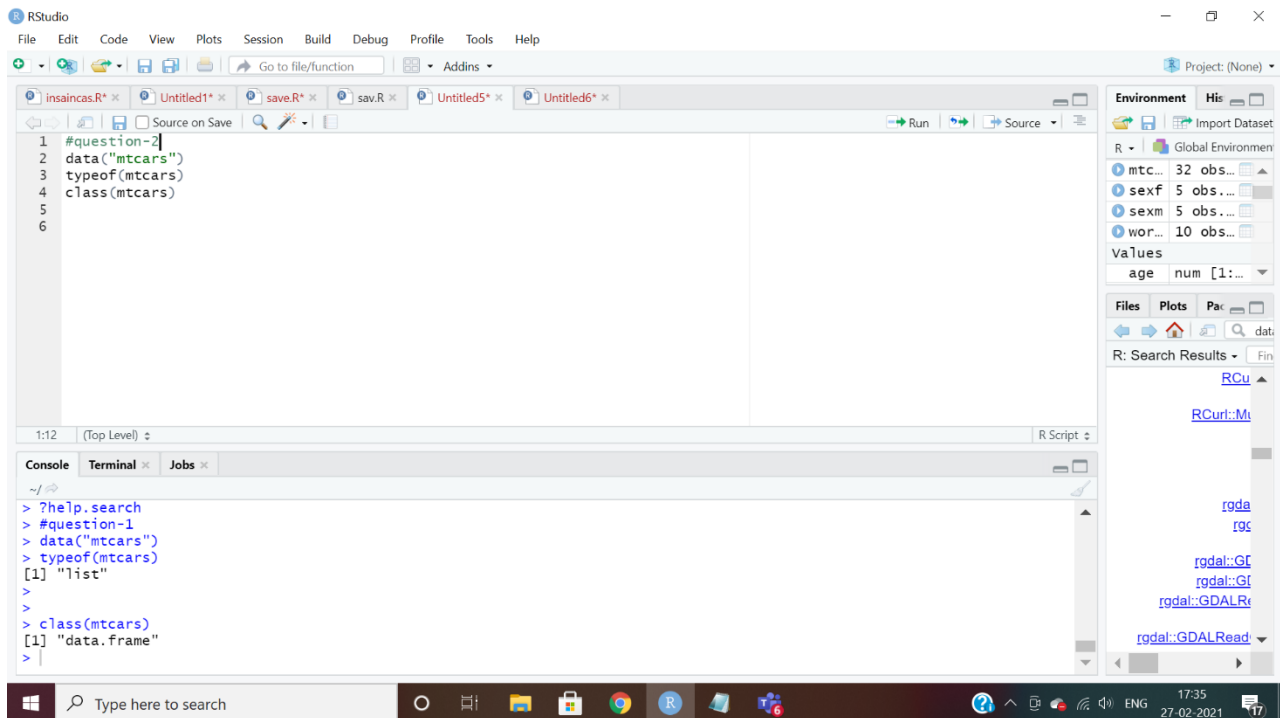
```
RStudio  
File Edit Code View Plots Session Build Debug Profile Tools Help  
Go to file/function Addins Project: (None)  
Source  
Console Terminal Jobs  
~/  
[1] "34=11+23"  
[1] "34=17+17"  
> data()  
> data()  
> data("mtcars")  
> data("mtcars")  
> data("mtcars")  
>  
> head(mtcars)  
      mpg  cyl  disp  hp drat   wt  qsec vs am gear carb  
Mazda RX4         21.0   6  160 110 3.90 2.620 16.46  0  1   4   4  
Mazda RX4 Wag     21.0   6  160 110 3.90 2.875 17.02  0  1   4   4  
Datsun 710         22.8   4  108  93 3.85 2.320 18.61  1  1   4   1  
Hornet 4 Drive     21.4   6  258 110 3.08 3.215 19.44  1  0   3   1  
Hornet Sportabout 18.7   8  360 175 3.15 3.440 17.02  0  0   3   2  
Valiant           18.1   6  225 105 2.76 3.460 20.22  1  0   3   1  
> str(mtcars)  
'data.frame':   32 obs. of  11 variables:  
 $ mpg : num  21 21 22.8 21.4 18.7 18.1 14.3 24.4 22.8 19.2 ...  
 $ cyl : num   6  6  4  6  8  6  8  4  4  6 ...  
 $ disp: num  160 160 108 258 360 ...  
 $ hp  : num  110 110 93 110 175 105 245 62 95 123 ...  
 $ drat: num   3.9 3.9 3.85 3.08 3.15 2.76 3.21 3.69 3.92 3.92 ...  
 $ wt  : num   2.62 2.88 2.32 3.21 3.44 ...  
 $ qsec: num  16.5 17 18.6 19.4 17 ...  
 $ vs  : num   0  0  1  1  0  1  0  1  1  1 ...  
 $ am  : num   1  1  1  0  0  0  0  0  0  0 ...  
 $ gear: num   4  4  4  3  3  3  4  4  4  4 ...  
 $ carb: num   4  4  1  1  2  1  4  2  2  4 ...  
> |
```

Q2) What is the datatype of the dataset?

Answer:

```
data("mtcars")  
typeof(mtcars)  
class(mtcars)
```

OUTPUT



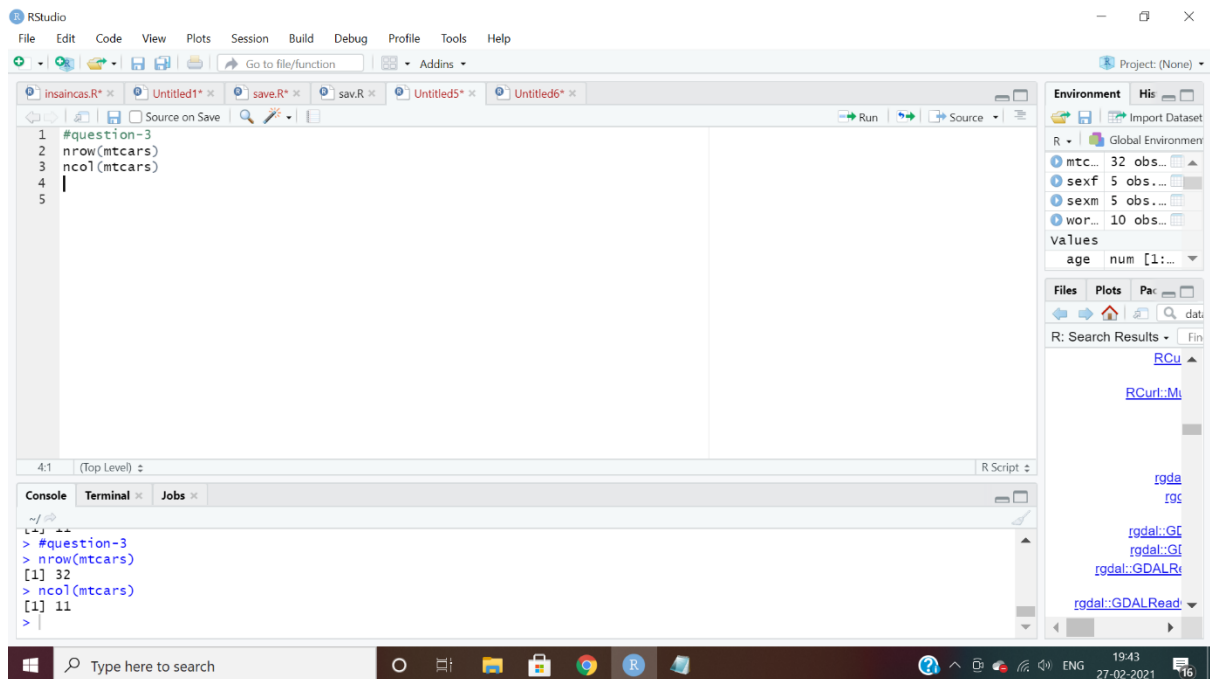
Q3) How many columns and rows are there in the dataset??

Answer:

nrow(mtcars)

ncol(mtcars)

OUTPUT



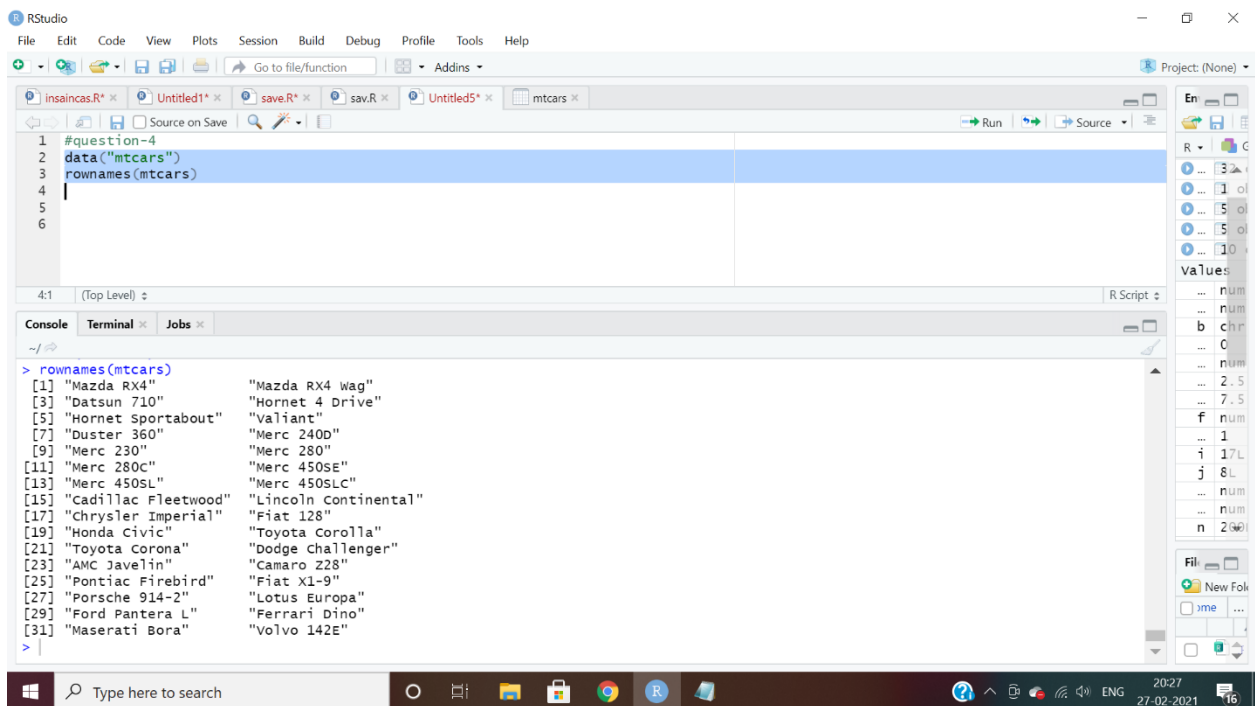
Q4) Print the row names

Answer:

```
data("mtcars")
```

```
rownames(mtcars)
```

OUTPUT



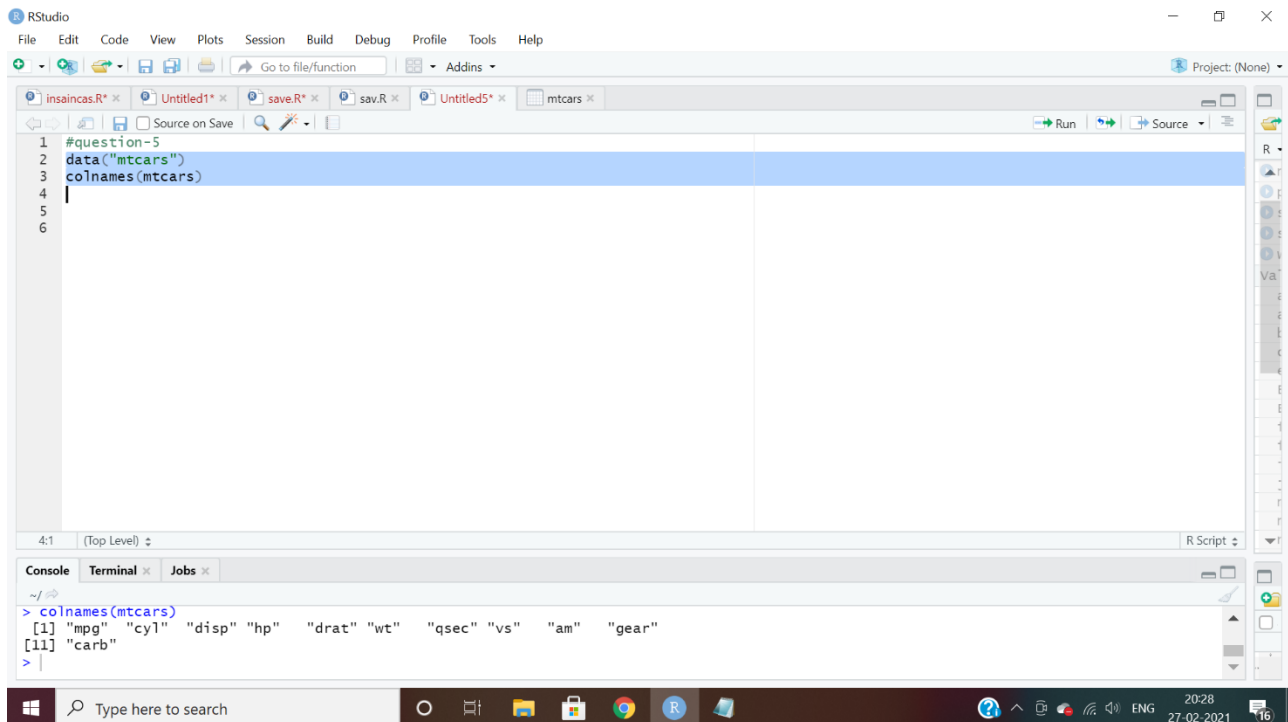
Q5) Print the column names

Answer:

```
data("mtcars")
```

```
colnames(mtcars)
```

OUTPUT



The screenshot shows the RStudio interface. The script editor at the top contains the following code:

```
1 #question-5
2 data("mtcars")
3 colnames(mtcars)
4
5
6
```

The console at the bottom shows the output of the command:

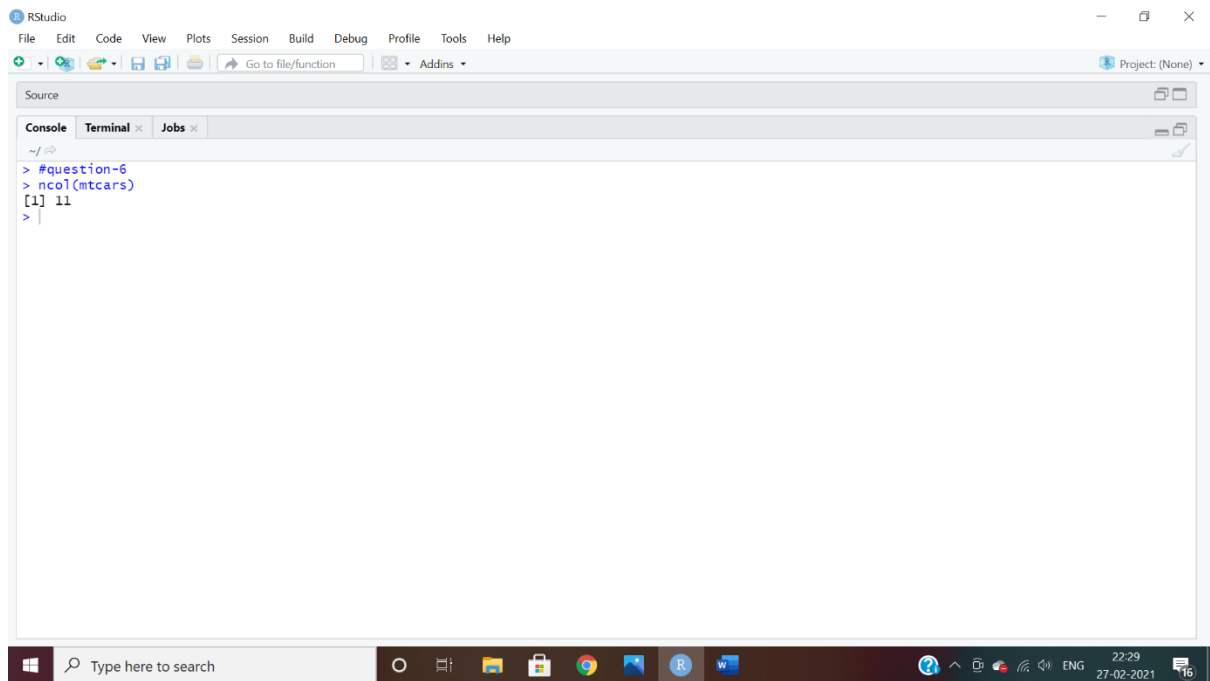
```
> colnames(mtcars)
[1] "mpg" "cyl" "disp" "hp" "drat" "wt" "qsec" "vs" "am" "gear"
[11] "carb"
>
```

Q6) Print the number of columns in mtcars

Answer:

```
ncol(mtcars)
```

OUTPUT

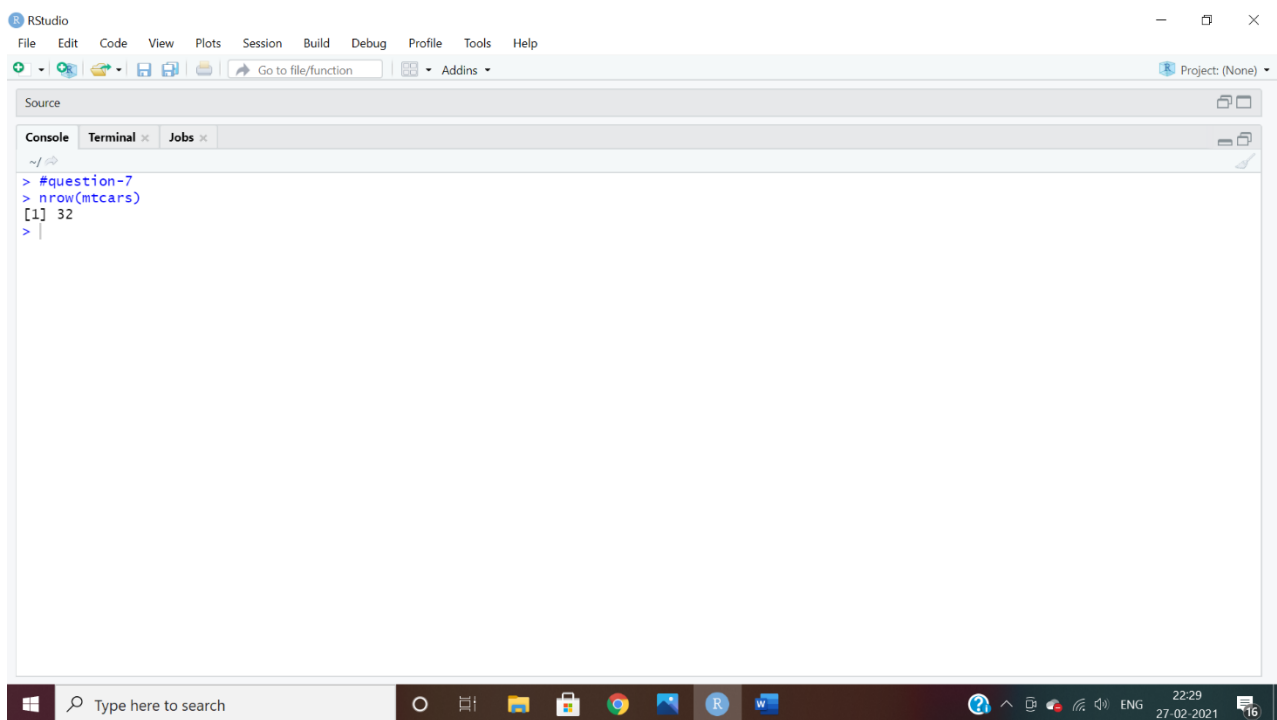


Q7) Print the number of rows

Answer:

nrow(mtcars)

OUTPUT



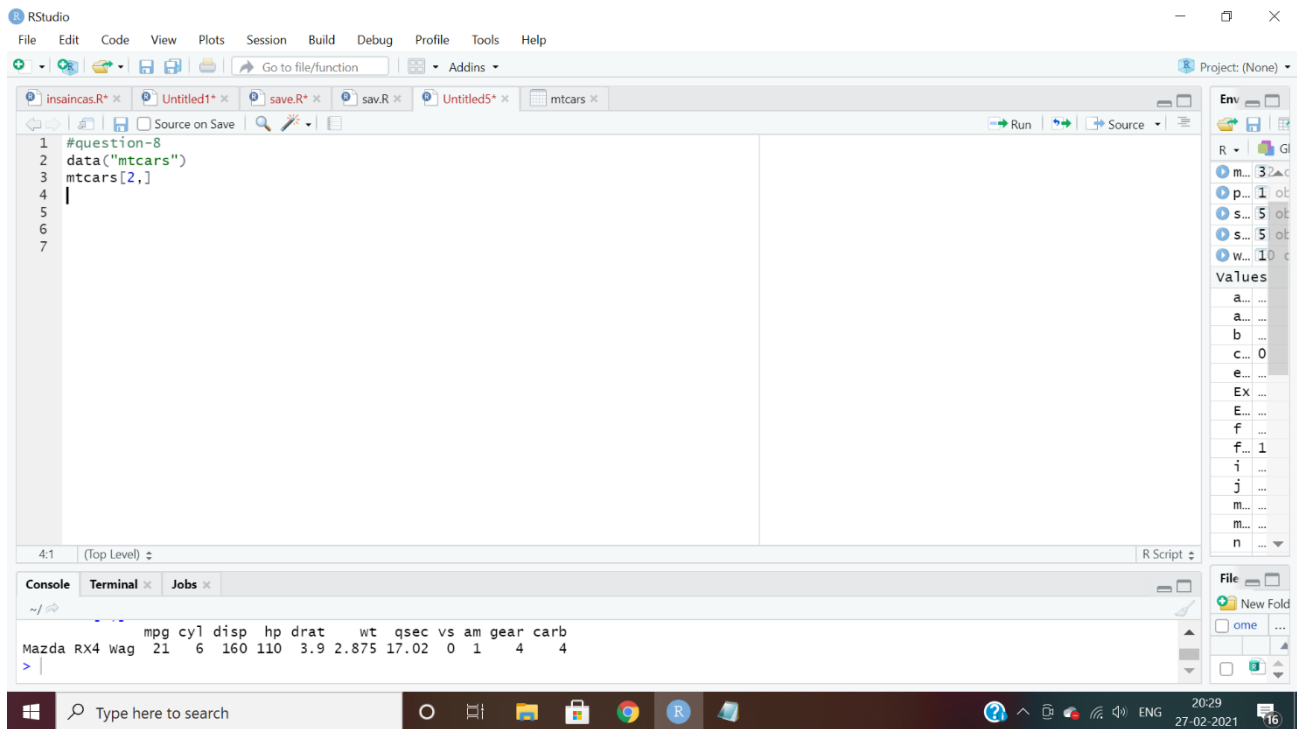
Q8) Print all the elements of 2nd row

Answer:

```
data("mtcars")
```

```
mtcars[2,]
```

OUTPUT



The screenshot shows the RStudio interface. The script editor on the left contains the following code:

```
1 #question-8
2 data("mtcars")
3 mtcars[2,]
4 |
5
6
7
```

The console at the bottom displays the output of the code, showing the 2nd row of the mtcars dataset:

```
mpg cyl disp hp drat wt  qsec vs am gear carb
Mazda RX4 wag  21   6  160 110  3.9 2.875 17.02  0  1   4    4
```

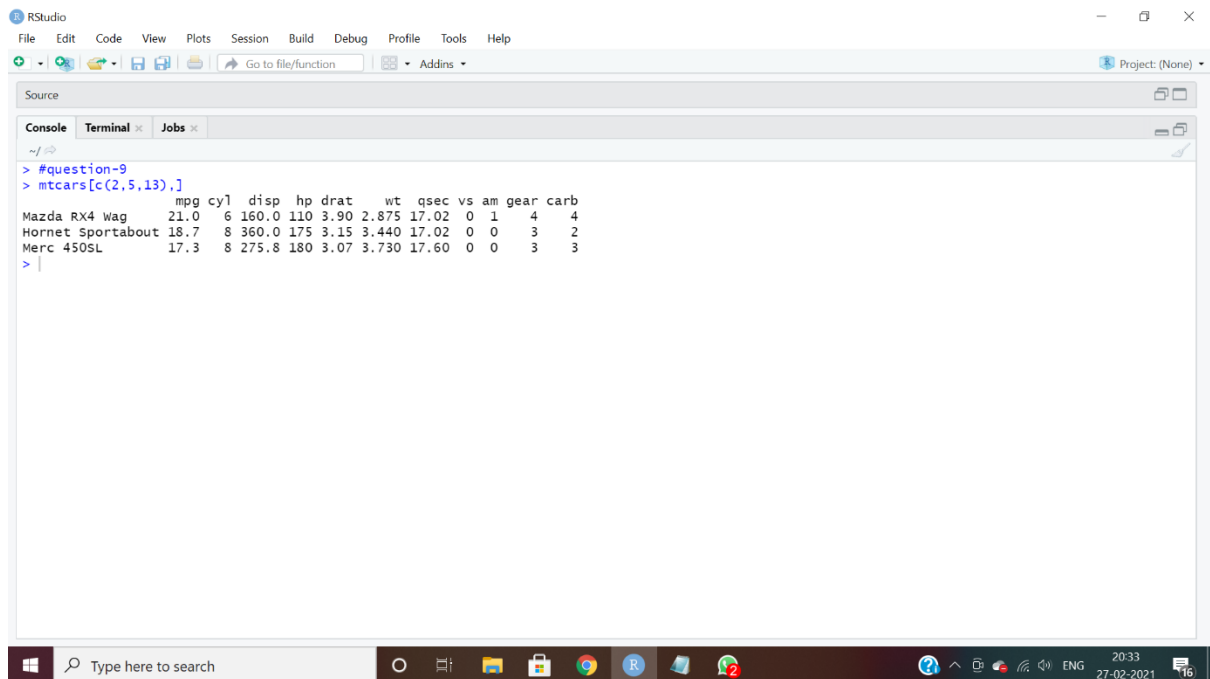
The right-hand pane shows the Environment window with a list of objects, including 'mtcars', and the Values window showing the structure of the data frame.

Q9) Print all the elements of 2nd, 5th and 13th row

Answer:

```
mtcars[c(2,5,13),]
```

OUTPUT



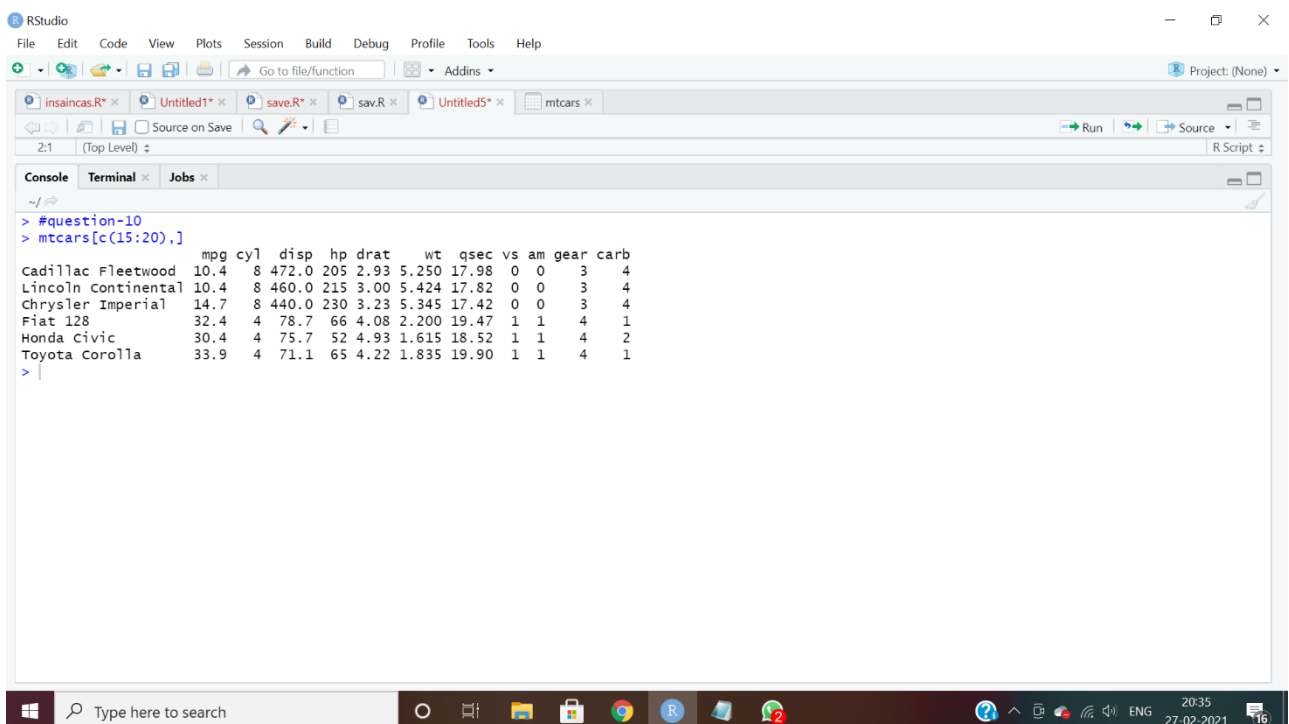
```
> #question-9
> mtcars[c(2,5,13),]
      mpg  cyl  disp  hp drat   wt  qsec vs am gear carb
Mazda RX4 Wag  21.0   6  160.0 110 3.90 2.875 17.02 0  1   4    4
Hornet Sportabout 18.7   8  360.0 175 3.15 3.440 17.02 0  0   3    2
Merc 450SL      17.3   8  275.8 180 3.07 3.730 17.60 0  0   3    3
>
```

Q10) Print the elements of rows from 15 to 20

Answer:

`mtcars[c(15:20),]`

OUTPUT



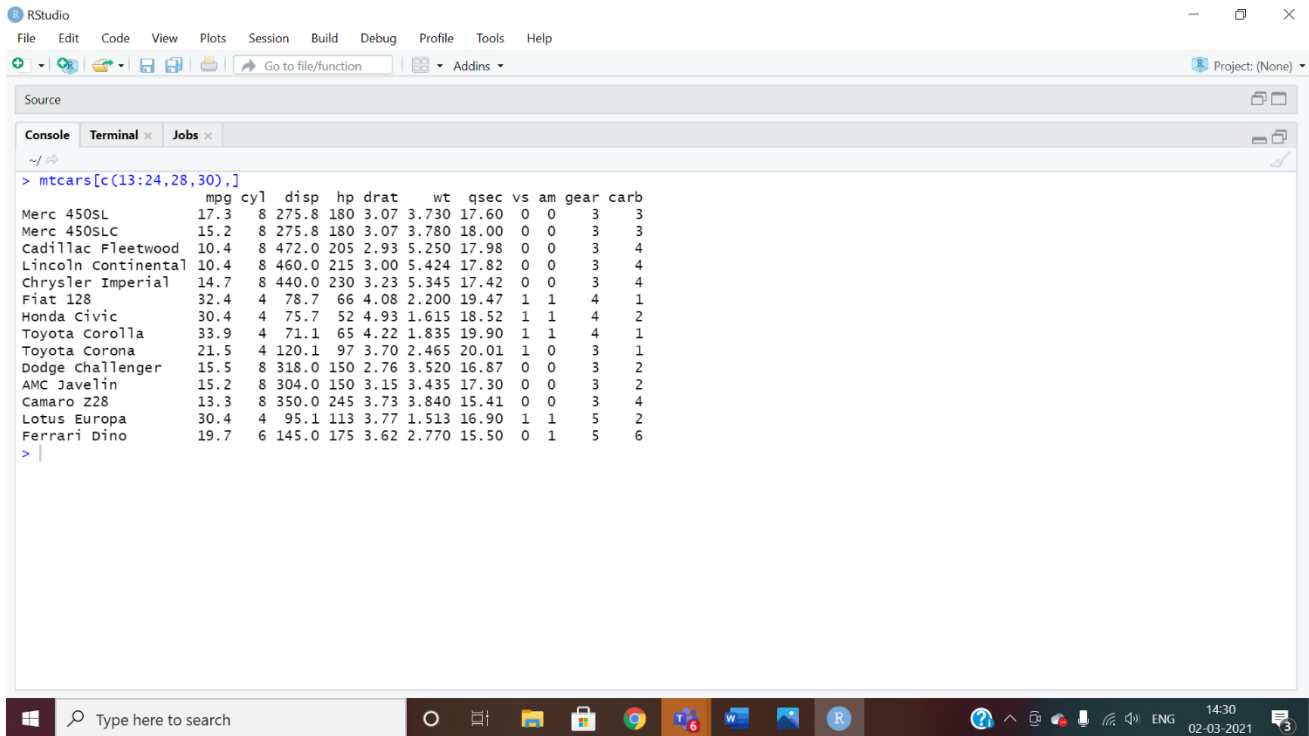
```
> #question-10
> mtcars[c(15:20),]
      mpg  cyl  disp  hp drat   wt  qsec vs am gear carb
Cadillac Fleetwood  10.4   8 472.0 205 2.93 5.250 17.98 0  0   3    4
Lincoln Continental  10.4   8 460.0 215 3.00 5.424 17.82 0  0   3    4
Chrysler Imperial   14.7   8 440.0 230 3.23 5.345 17.42 0  0   3    4
Fiat 128             32.4   4  78.7  66 4.08 2.200 19.47 1  1   4    1
Honda Civic          30.4   4  75.7  52 4.93 1.615 18.52 1  1   4    2
Toyota Corolla       33.9   4  71.1  65 4.22 1.835 19.90 1  1   4    1
>
```

Q11) Print the elements of rows from 13 to 24, 28 and 30

Answer:

```
mtcars[c(13:24,28,30),]
```

OUTPUT



The screenshot shows the RStudio interface with the console window open. The command `> mtcars[c(13:24,28,30),]` has been executed, resulting in a data frame of 16 rows and 11 columns. The rows correspond to the 13th through 24th rows of the original mtcars dataset, plus the 28th and 30th rows. The columns are mpg, cyl, disp, hp, drat, wt, qsec, vs, am, gear, and carb.

	mpg	cyl	disp	hp	drat	wt	qsec	vs	am	gear	carb
Merc 450SL	17.3	8	275.8	180	3.07	3.730	17.60	0	0	3	3
Merc 450SLC	15.2	8	275.8	180	3.07	3.780	18.00	0	0	3	3
Cadillac Fleetwood	10.4	8	472.0	205	2.93	5.250	17.98	0	0	3	4
Lincoln Continental	10.4	8	460.0	215	3.00	5.424	17.82	0	0	3	4
Chrysler Imperial	14.7	8	440.0	230	3.23	5.345	17.42	0	0	3	4
Fiat 128	32.4	4	78.7	66	4.08	2.200	19.47	1	1	4	1
Honda Civic	30.4	4	75.7	52	4.93	1.615	18.52	1	1	4	2
Toyota Corolla	33.9	4	71.1	65	4.22	1.835	19.90	1	1	4	1
Toyota Corona	21.5	4	120.1	97	3.70	2.465	20.01	1	0	3	1
Dodge challenger	15.5	8	318.0	150	2.76	3.520	16.87	0	0	3	2
AMC Javelin	15.2	8	304.0	150	3.15	3.435	17.30	0	0	3	2
Camaro Z28	13.3	8	350.0	245	3.73	3.840	15.41	0	0	3	4
Lotus Europa	30.4	4	95.1	113	3.77	1.513	16.90	1	1	5	2
Ferrari Dino	19.7	6	145.0	175	3.62	2.770	15.50	0	1	5	6

Q12) Print all odd indexed rows (rows 1,3,5,...)

Answer:

```
odd<-seq(1,nrow(mtcars),2)
```

```
mtcars[odd,]
```

OUTPUT


```
RStudio
File Edit Code View Plots Session Build Debug Profile Tools Help
Source
Console Terminal Jobs
~/
> #question-12
> odd<- seq(1,32,2)
> mtcars[odd,]

      mpg  cyl  disp  hp drat   wt  qsec vs am gear carb
Mazda RX4         21.0   6  160.0 110 3.90 2.620 16.46 0 1 4 4
Datsun 710        22.8   4  108.0  93 3.85 2.320 18.61 1 1 4 1
Hornet Sportabout 18.7   8  360.0 175 3.15 3.440 17.02 0 0 3 2
Duster 360        14.3   8  360.0 245 3.21 3.570 15.84 0 0 3 4
Merc 280          22.8   4  140.8  95 3.92 3.150 22.90 1 0 4 2
Merc 280C         17.8   6  167.6 123 3.92 3.440 18.90 1 0 4 4
Merc 450SL        17.3   8  275.8 180 3.07 3.730 17.60 0 0 3 3
Cadillac Fleetwood 10.4   8  472.0 205 2.93 5.250 17.98 0 0 3 4
Chrysler Imperial 14.7   8  440.0 230 3.23 5.345 17.42 0 0 3 4
Honda Civic       30.4   4   75.7  52 4.93 1.615 18.52 1 1 4 2
Toyota Corona     21.5   4  120.1  97 3.70 2.465 20.01 1 0 3 1
AMC Javelin       15.2   8  304.0 150 3.15 3.435 17.30 0 0 3 2
Pontiac Firebird  19.2   8  400.0 175 3.08 3.845 17.05 0 0 3 2
Porsche 914-2     26.0   4  120.3  91 4.43 2.140 16.70 0 1 5 2
Ford Pantera L    15.8   8  351.0 264 4.22 3.170 14.50 0 1 5 4
Maserati Bora     15.0   8  301.0 335 3.54 3.570 14.60 0 1 5 8
>
```

Q13) Print all even indexed rows (rows 2,4,6,...)

Answer:

```
even <- seq(2,nrow(mtcars),2)
```

```
mtcars[even,]
```

OUTPUT

```
RStudio
File Edit Code View Plots Session Build Debug Profile Tools Help
Source
Console Terminal Jobs
~/
> #question-13
> even<- seq(2,32,2)
> mtcars[even,]

      mpg  cyl  disp  hp drat   wt  qsec vs am gear carb
Mazda RX4 Wag     21.0   6  160.0 110 3.90 2.875 17.02 0 1 4 4
Hornet 4 Drive    21.4   6  258.0 110 3.08 3.215 19.44 1 0 3 1
Valiant          18.1   6  225.0 105 2.76 3.460 20.22 1 0 3 1
Merc 240D        24.4   4  146.7  62 3.69 3.190 20.00 1 0 4 2
Merc 280         19.2   6  167.6 123 3.92 3.440 18.30 1 0 4 4
Merc 450SE       16.4   8  275.8 180 3.07 4.070 17.40 0 0 3 3
Merc 450SLC      15.2   8  275.8 180 3.07 3.780 18.00 0 0 3 3
Lincoln Continental 10.4   8  460.0 215 3.00 5.424 17.82 0 0 3 4
Fiat 128         32.4   4   78.7  66 4.08 2.200 19.47 1 1 4 1
Toyota Corolla   33.9   4   71.1  65 4.22 1.835 19.90 1 1 4 1
Dodge Challenger 15.5   8  318.0 150 2.76 3.520 16.87 0 0 3 2
Camaro Z28       13.3   8  350.0 245 3.73 3.840 15.41 0 0 3 4
Fiat X1-9        27.3   4   79.0  66 4.08 1.935 18.90 1 1 4 1
Lotus Europa     30.4   4   95.1 113 3.77 1.513 16.90 1 1 5 2
Ferrari Dino     19.7   6  145.0 175 3.62 2.770 15.50 0 1 5 6
Volvo 142E       21.4   4  121.0 109 4.11 2.780 18.60 1 1 4 2
>
```

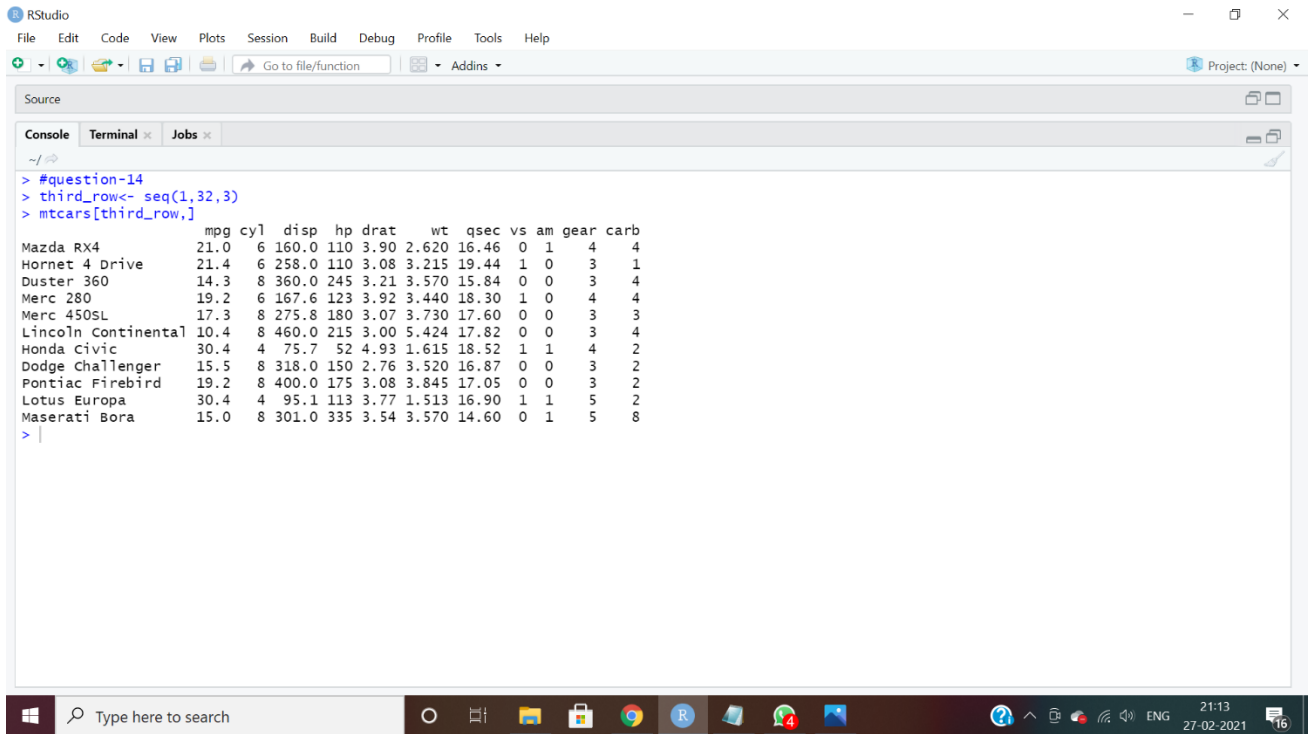
Q14) Print every 3rd row from 1st row (1,4,7,10..)

Answer:

```
third_row<- seq(1,nrow(mtcars),3)

mtcars[third_row,]
```

OUTPUT



The screenshot shows the RStudio interface with the console window open. The code entered is: `> #question-14`, `> third_row<- seq(1,32,3)`, and `> mtcars[third_row,]`. The output displays the 1st, 4th, 7th, 10th, 13th, 16th, 19th, 22nd, 25th, 28th, and 31st rows of the `mtcars` dataset. The output is formatted as a table with columns: `mpg`, `cyl`, `disp`, `hp`, `drat`, `wt`, `qsec`, `vs`, `am`, `gear`, and `carb`.

	mpg	cyl	disp	hp	drat	wt	qsec	vs	am	gear	carb
Mazda RX4	21.0	6	160.0	110	3.90	2.620	16.46	0	1	4	4
Hornet 4 Drive	21.4	6	258.0	110	3.08	3.215	19.44	1	0	3	1
Duster 360	14.3	8	360.0	245	3.21	3.570	15.84	0	0	3	4
Merc 280	19.2	6	167.6	123	3.92	3.440	18.30	1	0	4	4
Merc 450SL	17.3	8	275.8	180	3.07	3.730	17.60	0	0	3	3
Lincoln Continental	10.4	8	460.0	215	3.00	5.424	17.82	0	0	3	4
Honda Civic	30.4	4	75.7	52	4.93	1.615	18.52	1	1	4	2
Dodge Challenger	15.5	8	318.0	150	2.76	3.520	16.87	0	0	3	2
Pontiac Firebird	19.2	8	400.0	175	3.08	3.845	17.05	0	0	3	2
Lotus Europa	30.4	4	95.1	113	3.77	1.513	16.90	1	1	5	2
Maserati Bora	15.0	8	301.0	335	3.54	3.570	14.60	0	1	5	8

Q15) Print first row and last row

Answer:

```
mtcars[c(1,nrow(mtcars)),]
```

OUTPUT

RStudio

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Source

Console Terminal Jobs

```
> #question-15
> mtcars[c(1:nrow(mtcars)),]
      mpg  cyl  disp  hp  drat   wt   qsec vs  am  gear carb
Mazda RX4  21.0   6  160 110 3.90 2.62 16.46 0  1   4     4
Volvo 142E  21.4   4  121 109 4.11 2.78 18.60 1  1   4     2
> |
```

Type here to search

21:50 27-02-2021

Q16) Print last 3 rows without using tail() function

Answer:

```
mtcars[(c((nrow(mtcars)-2):nrow(mtcars))),]
```

OUTPUT

RStudio

File Edit Code View Plots Session Build Debug Profile Tools Help

Source

Console Terminal Jobs

```
> #question-16
> mtcars[(c((nrow(mtcars)-2):nrow(mtcars))),]
      mpg  cyl  disp  hp  drat   wt   qsec vs  am  gear carb
Ferrari Dino  19.7   6  145 175 3.62 2.77 15.5 0  1   5     6
Maserati Bora  15.0   8  301 335 3.54 3.57 14.6 0  1   5     8
Volvo 142E    21.4   4  121 109 4.11 2.78 18.6 1  1   4     2
> |
```

Type here to search

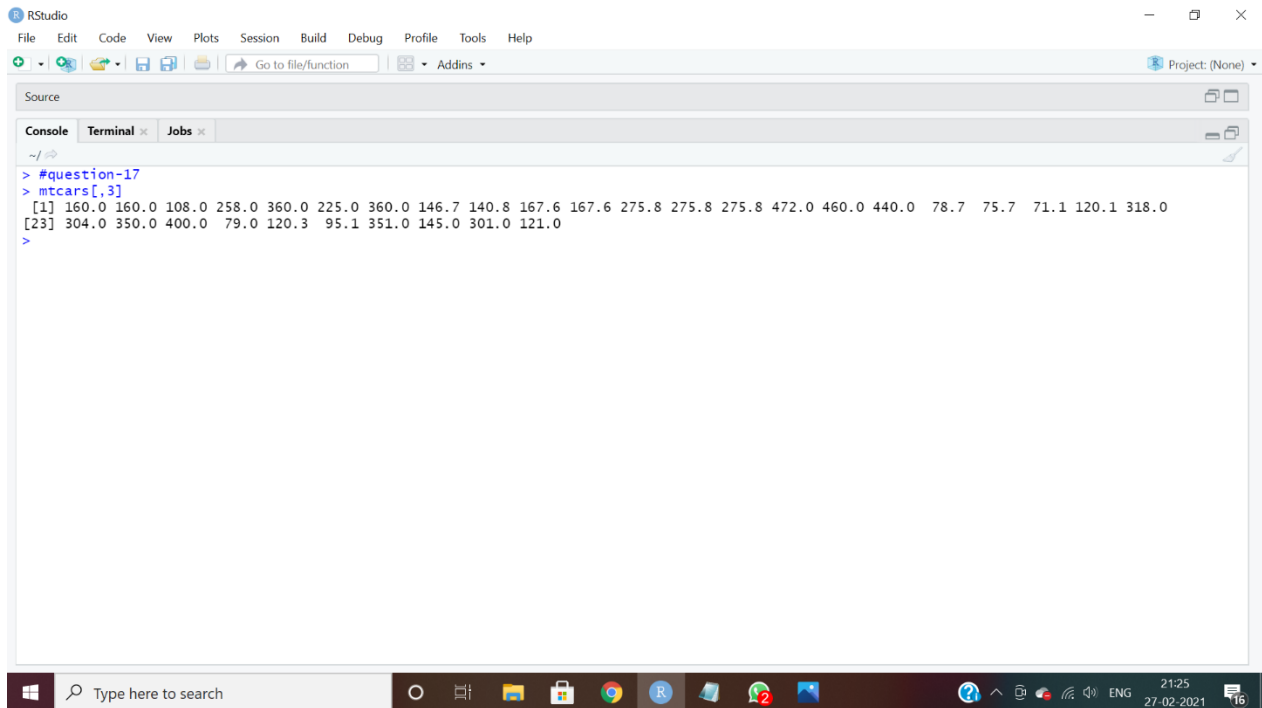
21:46 27-02-2021

Q17) Print the elements of 3rd column

Answer:

```
mtcars[,3]
```

OUTPUT



The screenshot shows the RStudio interface with the console pane active. The command `mtcars[,3]` has been executed, resulting in the following output:

```
> #question-17
> mtcars[,3]
[1] 160.0 160.0 108.0 258.0 360.0 225.0 360.0 146.7 140.8 167.6 167.6 275.8 275.8 275.8 472.0 460.0 440.0 78.7 75.7 71.1 120.1 318.0
[23] 304.0 350.0 400.0 79.0 120.3 95.1 351.0 145.0 301.0 121.0
>
```

Q18) Print first three columns

Answer:

```
colnames(mtcars[,1:3])
```

OUTPUT

The screenshot shows the RStudio interface. The console window displays the following R code and its output:

```
> #Question-18
> colnames(mtcars[,1:3])
[1] "mpg" "cyl" "disp"
>
```

The Windows taskbar at the bottom shows the date as 27-02-2021 and the time as 21:28.

Q19) Print the elements of columns from 5 to 10

Answer:

```
mtcars[,c(5:10)]
```

OUTPUT

The screenshot shows the RStudio interface. The console window displays the following R code and its output:

```
> #question-19
> mtcars[,c(5:10)]
```

	drat	wt	qsec	vs	am	gear
Mazda RX4	3.90	2.620	16.46	0	1	4
Mazda RX4 Wag	3.90	2.875	17.02	0	1	4
Datsun 710	3.85	2.320	18.61	1	1	4
Hornet 4 Drive	3.08	3.215	19.44	1	0	3
Hornet Sportabout	3.15	3.440	17.02	0	0	3
Valiant	2.76	3.460	20.22	1	0	3
Duster 360	3.21	3.570	15.84	0	0	3
Merc 240D	3.69	3.190	20.00	1	0	4
Merc 230	3.92	3.150	22.90	1	0	4
Merc 280	3.92	3.440	18.30	1	0	4
Merc 280C	3.92	3.440	18.90	1	0	4
Merc 450SE	3.07	4.070	17.40	0	0	3
Merc 450SL	3.07	3.730	17.60	0	0	3
Merc 450SLC	3.07	3.780	18.00	0	0	3
Cadillac Fleetwood	2.93	5.250	17.98	0	0	3
Lincoln Continental	3.00	5.424	17.82	0	0	3
Chrysler Imperial	3.23	5.345	17.42	0	0	3
Fiat 128	4.08	2.200	19.47	1	1	4
Honda civic	4.93	1.615	18.52	1	1	4
Toyota Corolla	4.22	1.835	19.90	1	1	4
Toyota Corona	3.70	2.465	20.01	1	0	3
Dodge Challenger	2.76	3.520	16.87	0	0	3
AMC Javelin	3.15	3.435	17.30	0	0	3
Camaro Z28	3.73	3.840	15.41	0	0	3
Pontiac Firebird	3.08	3.845	17.05	0	0	3
Fiat X1-9	4.08	1.935	18.90	1	1	4
Porsche 914-2	4.43	2.140	16.70	0	1	5

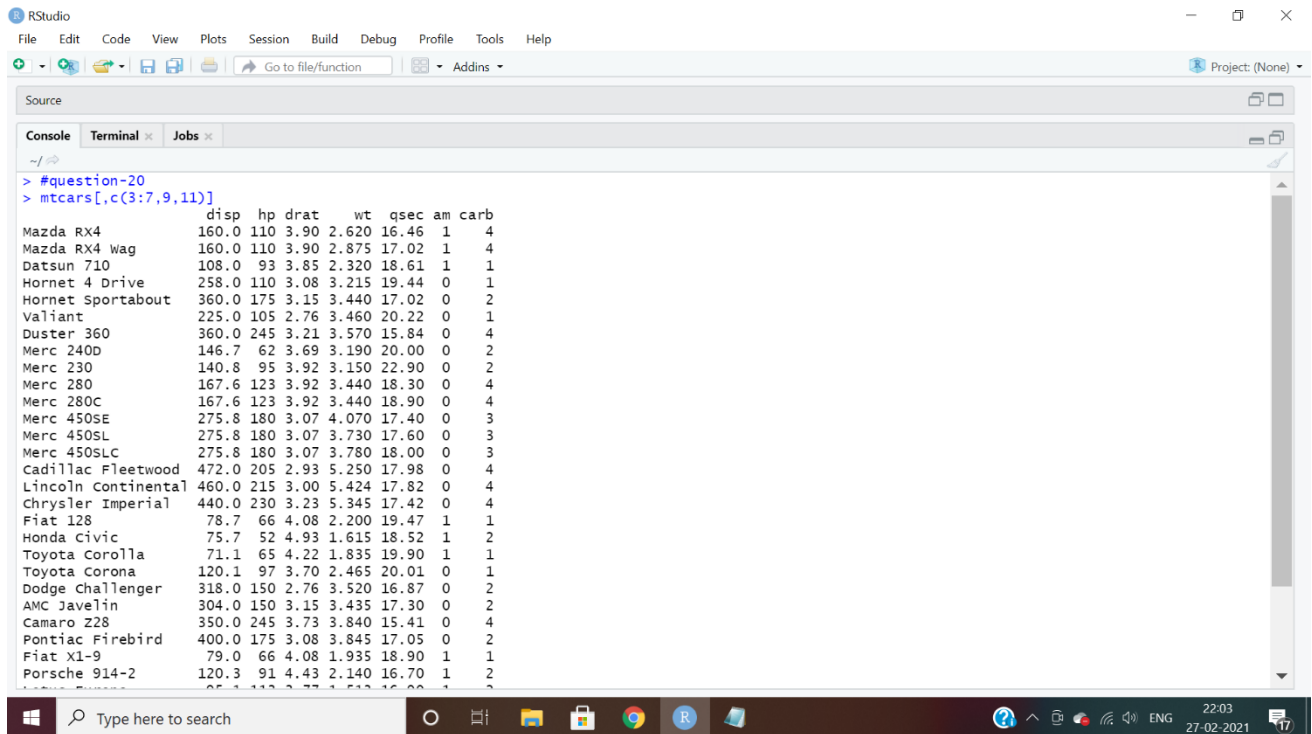
The Windows taskbar at the bottom shows the date as 27-02-2021 and the time as 22:02.

Q20) Print the elements of columns from 3 to 7, 9 and 11

Answer:

```
mtcars[,c(3:7,9,11)]
```

OUTPUT



```
RStudio
File Edit Code View Plots Session Build Debug Profile Tools Help
Go to file/function Addins Project: (None)
Source
Console Terminal Jobs
~/
> #question-20
> mtcars[,c(3:7,9,11)]
      disp  hp drat   wt  qsec am carb
Mazda RX4    160.0 110 3.90 2.620 16.46 1   4
Mazda RX4 Wag 160.0 110 3.90 2.875 17.02 1   4
Datsun 710    108.0  93 3.85 2.320 18.61 1   1
Hornet 4 Drive 258.0 110 3.08 3.215 19.44 0   1
Hornet Sportabout 360.0 175 3.15 3.440 17.02 0   2
Valiant      225.0 105 2.76 3.460 20.22 0   1
Duster 360   360.0 245 3.21 3.570 15.84 0   4
Merc 240D    146.7  62 3.69 3.190 20.00 0   2
Merc 230     140.8  95 3.92 3.150 22.90 0   2
Merc 280     167.6 123 3.92 3.440 18.30 0   4
Merc 280C    167.6 123 3.92 3.440 18.90 0   4
Merc 450SE   275.8 180 3.07 4.070 17.40 0   3
Merc 450SL   275.8 180 3.07 3.730 17.60 0   3
Merc 450SLC  275.8 180 3.07 3.780 18.00 0   3
Cadillac Fleetwood 472.0 205 2.93 5.250 17.98 0   4
Lincoln Continental 460.0 215 3.00 5.424 17.82 0   4
Chrysler Imperial 440.0 230 3.23 5.345 17.42 0   4
Fiat 128      78.7  66 4.08 2.200 19.47 1   1
Honda Civic   75.7  52 4.93 1.615 18.52 1   2
Toyota Corolla 71.1  65 4.22 1.835 19.90 1   1
Toyota Corona 120.1  97 3.70 2.465 20.01 0   1
Dodge Challenger 318.0 150 2.76 3.520 16.87 0   2
AMC Javelin   304.0 150 3.15 3.435 17.30 0   2
Camaro Z28    350.0 245 3.73 3.840 15.41 0   4
Pontiac Firebird 400.0 175 3.08 3.845 17.05 0   2
Fiat X1-9      79.0  66 4.08 1.935 18.90 1   1
Porsche 914-2 120.3  91 4.43 2.140 16.70 1   2
```

Q21) Print all odd indexed columns (1,3,5,...)

Answer:

```
odd<- seq(1,ncol(mtcars),2)
```

```
mtcars[,odd]
```

OUTPUT

```
RStudio
File Edit Code View Plots Session Build Debug Profile Tools Help
Go to file/function Addins Project: (None)

Source
Console Terminal Jobs
~/
> #question-21
> odd<- seq(1,ncol(mtcars),2)
> mtcars[,odd]

      mpg  disp drat  qsec am carb
Mazda RX4      21.0 160.0 3.90 16.46 1 4
Mazda RX4 Wag  21.0 160.0 3.90 17.02 1 4
Datsun 710      22.8 108.0 3.85 18.61 1 1
Hornet 4 Drive  21.4 258.0 3.08 19.44 0 1
Hornet Sportabout 18.7 360.0 3.15 17.02 0 2
Valiant         18.1 225.0 2.76 20.22 0 1
Duster 360      14.3 360.0 3.21 15.84 0 4
Merc 240D       24.4 146.7 3.69 20.00 0 2
Merc 230        22.8 140.8 3.92 22.90 0 2
Merc 280        19.2 167.6 3.92 18.30 0 4
Merc 280C       17.8 167.6 3.92 18.90 0 4
Merc 450SE      16.4 275.8 3.07 17.40 0 3
Merc 450SL      17.3 275.8 3.07 17.60 0 3
Merc 450SLC     15.2 275.8 3.07 18.00 0 3
Cadillac Fleetwood 10.4 472.0 2.93 17.98 0 4
Lincoln Continental 10.4 460.0 3.00 17.82 0 4
Chrysler Imperial 14.7 440.0 3.23 17.42 0 4
Fiat 128        32.4 78.7 4.08 19.47 1 1
Honda Civic     30.4 75.7 4.93 18.52 1 2
Toyota Corolla  33.9 71.1 4.22 19.90 1 1
Toyota Corona  21.5 120.1 3.70 20.01 0 1
Dodge Challenger 15.5 318.0 2.76 16.87 0 2
AMC Javelin     15.2 304.0 3.15 17.30 0 2
Camaro Z28      13.3 350.0 3.73 15.41 0 4
Pontiac Firebird 19.2 400.0 3.08 17.05 0 2
Fiat X1-9       27.3 79.0 4.08 18.90 1 1
```

Q22) Print all even indexed columns (2,4,6,...)

Answer:

```
even<- seq(2,ncol(mtcars),2)
```

```
mtcars[,even]
```

OUTPUT

```
RStudio
File Edit Code View Plots Session Build Debug Profile Tools Help
Go to file/function Addins Project: (None)

Source
Console Terminal Jobs
~/
> #question-22
> even<- seq(2,ncol(mtcars),2)
> mtcars[,even]

      cyl  hp  wt vs gear
Mazda RX4      6 110 2.620 0 4
Mazda RX4 Wag  6 110 2.875 0 4
Datsun 710      4 93 2.320 1 4
Hornet 4 Drive  6 110 3.215 1 3
Hornet Sportabout 8 175 3.440 0 3
Valiant        6 105 3.460 1 3
Duster 360     8 245 3.570 0 3
Merc 240D      4 62 3.190 1 4
Merc 230       4 95 3.150 1 4
Merc 280       6 123 3.440 1 4
Merc 280C      6 123 3.440 1 4
Merc 450SE     8 180 4.070 0 3
Merc 450SL     8 180 3.730 0 3
Merc 450SLC    8 180 3.780 0 3
Cadillac Fleetwood 8 205 5.250 0 3
Lincoln Continental 8 215 5.424 0 3
Chrysler Imperial 8 230 5.345 0 3
Fiat 128       4 66 2.200 1 4
Honda Civic    4 52 1.615 1 4
Toyota Corolla 4 65 1.835 1 4
Toyota Corona  4 97 2.465 1 3
Dodge Challenger 8 150 3.520 0 3
AMC Javelin    8 150 3.435 0 3
Camaro Z28     8 245 3.840 0 3
Pontiac Firebird 8 175 3.845 0 3
Fiat X1-9      4 66 1.935 1 4
```

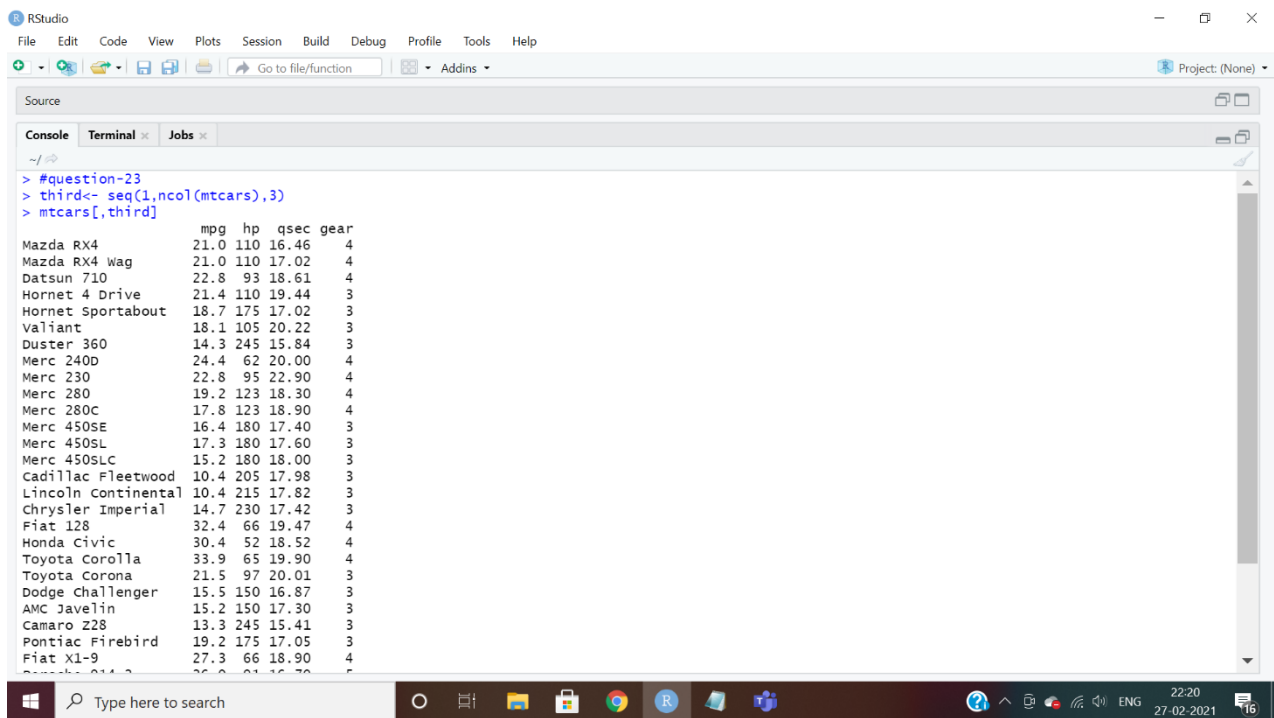
Q23) Print every 3rd column from 1st column (1,4,7,10..)

Answer:

```
third<- seq(1,ncol(mtcars),3)
```

```
mtcars[,third]
```

OUTPUT



The screenshot shows the RStudio interface with the console window open. The code entered is:

```
> #question-23
> third<- seq(1,ncol(mtcars),3)
> mtcars[,third]
```

The output is a data frame with 32 rows and 4 columns. The columns are labeled mpg, hp, qsec, and gear. The rows represent different car models and their specifications.

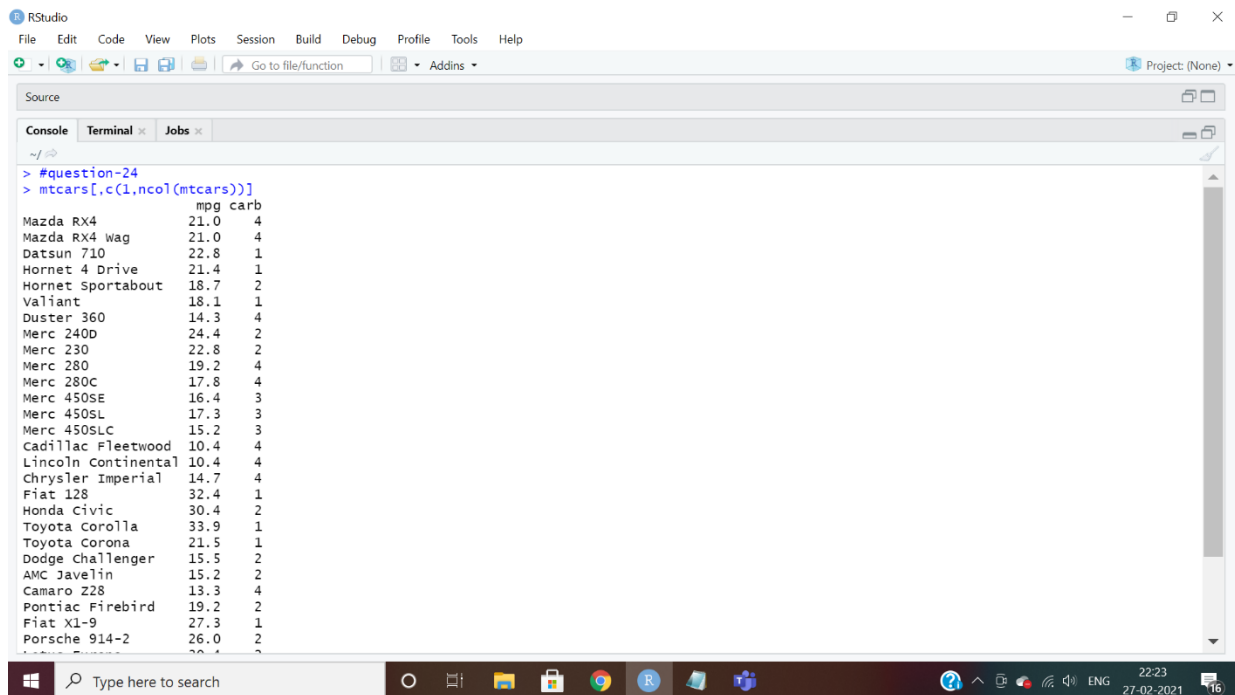
	mpg	hp	qsec	gear
Mazda RX4	21.0	110	16.46	4
Mazda RX4 Wag	21.0	110	17.02	4
Datsun 710	22.8	93	18.61	4
Hornet 4 Drive	21.4	110	19.44	3
Hornet Sportabout	18.7	175	17.02	3
Valiant	18.1	105	20.22	3
Duster 360	14.3	245	15.84	3
Merc 240D	24.4	62	20.00	4
Merc 230	22.8	95	22.90	4
Merc 280	19.2	123	18.30	4
Merc 280C	17.8	123	18.90	4
Merc 450SE	16.4	180	17.40	3
Merc 450SL	17.3	180	17.60	3
Merc 450SLC	15.2	180	18.00	3
Cadillac Fleetwood	10.4	205	17.98	3
Lincoln Continental	10.4	215	17.82	3
Chrysler Imperial	14.7	230	17.42	3
Fiat 128	32.4	66	19.47	4
Honda Civic	30.4	52	18.52	4
Toyota Corolla	33.9	65	19.90	4
Toyota Corona	21.5	97	20.01	3
Dodge Challenger	15.5	150	16.87	3
AMC Javelin	15.2	150	17.30	3
Camaro Z28	13.3	245	15.41	3
Pontiac Firebird	19.2	175	17.05	3
Fiat X1-9	27.3	66	18.90	4

Q24) Print first column and last column

Answer:

```
mtcars[,c(1,ncol(mtcars))]
```

OUTPUT



```
RStudio
File Edit Code View Plots Session Build Debug Profile Tools Help
Source
Console Terminal Jobs
~/
> #question-24
> mtcars[,c(1,ncol(mtcars))]
```

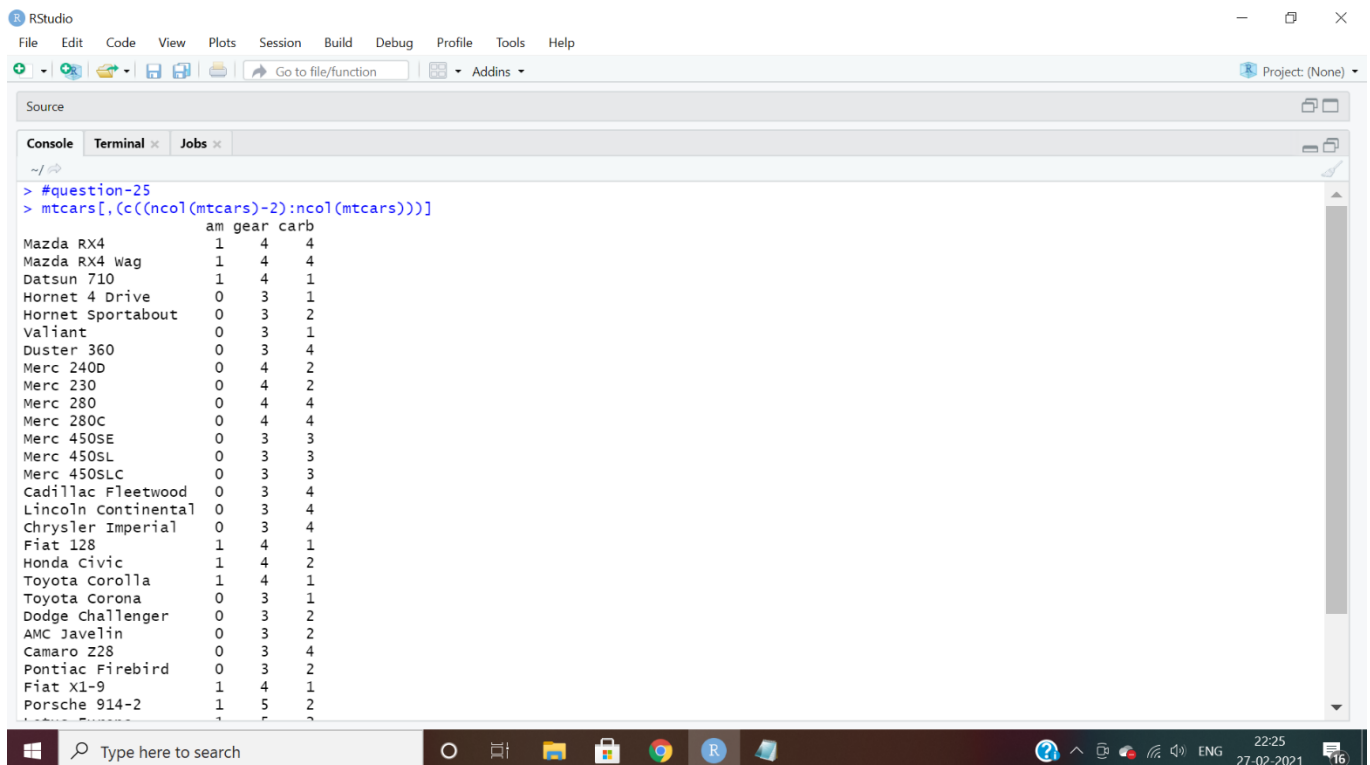
	mpg	carb
Mazda RX4	21.0	4
Mazda RX4 wag	21.0	4
Datsun 710	22.8	1
Hornet 4 Drive	21.4	1
Hornet Sportabout	18.7	2
Valiant	18.1	1
Duster 360	14.3	4
Merc 240D	24.4	2
Merc 230	22.8	2
Merc 280	19.2	4
Merc 280C	17.8	4
Merc 450SE	16.4	3
Merc 450SL	17.3	3
Merc 450SLC	15.2	3
Cadillac Fleetwood	10.4	4
Lincoln Continental	10.4	4
Chrysler Imperial	14.7	4
Fiat 128	32.4	1
Honda Civic	30.4	2
Toyota Corolla	33.9	1
Toyota Corona	21.5	1
Dodge Challenger	15.5	2
AMC Javelin	15.2	2
Camaro Z28	13.3	4
Pontiac Firebird	19.2	2
Fiat X1-9	27.3	1
Porsche 914-2	26.0	2

Q25) Print last 3 columns

Answer:

```
mtcars[,c((ncol(mtcars)-2):ncol(mtcars)))]
```

OUTPUT



```
RStudio
File Edit Code View Plots Session Build Debug Profile Tools Help
Source
Console Terminal Jobs
~/
> #question-25
> mtcars[,c((ncol(mtcars)-2):ncol(mtcars)))]
```

	am	gear	carb
Mazda RX4	1	4	4
Mazda RX4 wag	1	4	4
Datsun 710	1	4	1
Hornet 4 Drive	0	3	1
Hornet Sportabout	0	3	2
Valiant	0	3	1
Duster 360	0	3	4
Merc 240D	0	4	2
Merc 230	0	4	2
Merc 280	0	4	4
Merc 280C	0	4	4
Merc 450SE	0	3	3
Merc 450SL	0	3	3
Merc 450SLC	0	3	3
Cadillac Fleetwood	0	3	4
Lincoln Continental	0	3	4
Chrysler Imperial	0	3	4
Fiat 128	1	4	1
Honda Civic	1	4	2
Toyota Corolla	1	4	1
Toyota Corona	0	3	1
Dodge Challenger	0	3	2
AMC Javelin	0	3	2
Camaro Z28	0	3	4
Pontiac Firebird	0	3	2
Fiat X1-9	1	4	1
Porsche 914-2	1	5	2

