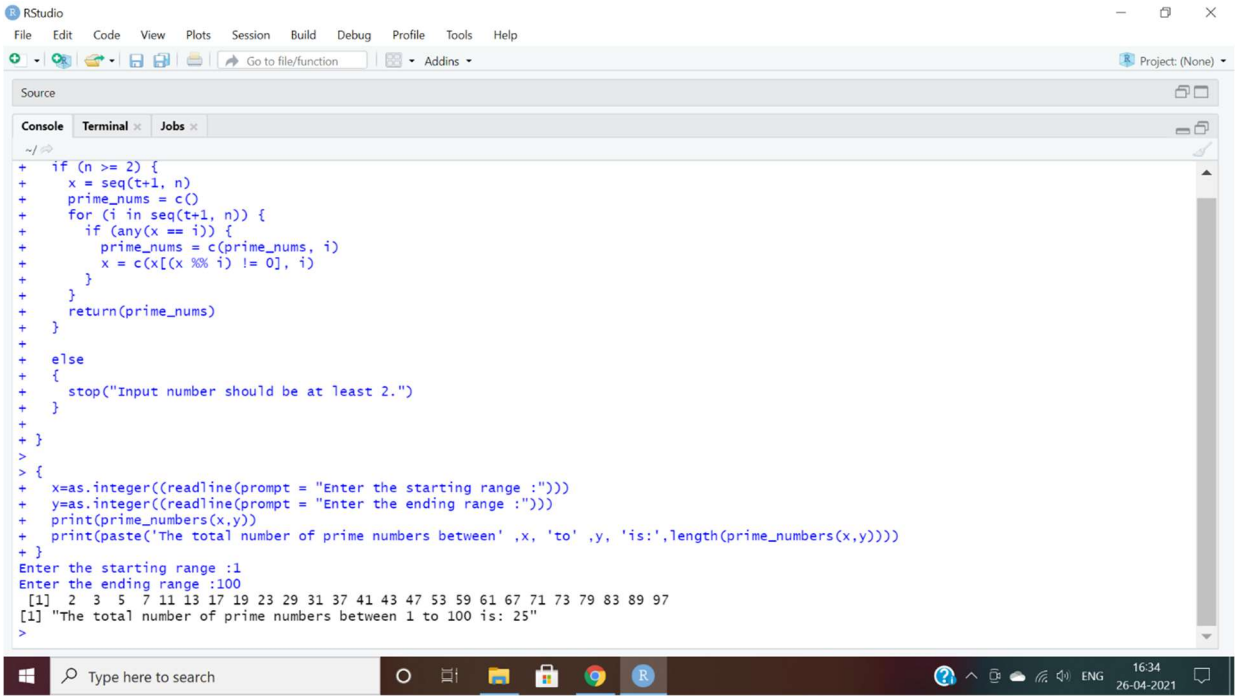
Lab Test #1 (Based on R)

Q1. Write a program in R to find prime number within a range. Input number for starting range: 1 Input number for ending range: 100 The prime numbers between 1 and 100 are: 2 3 5 7 11 13 17 19 23 29 31 37 41 43 47 53 59 61 67 71 73 79 83 89 97 The total number of prime numbers between 1 to 100 is: 25

Answer:

```
prime_numbers <- function(t,n) {
  if (n >= 2) {
    x = seq(t+1, n)
    prime_nums = c()
    for (i in seq(t+1, n)) {
      if (any(x == i)) {
        prime_nums = c(prime_nums, i)
        x = c(x[(x %% i) != 0], i)
      }
    }
    return(prime_nums)
  }
  else
  {
    stop("Input number should be at least 2.")
  }
}
{
  x=as.integer((readline(prompt = "Enter the starting range :")))
  y=as.integer((readline(prompt = "Enter the ending range :")))
  print(prime_numbers(x,y))
  print(paste('The total number of prime numbers between' ,x, 'to' ,y,
'is:',length(prime_numbers(x,y))))
}
```

OUTPUT



Q2. Create the 10*10 identity matrix and add it to another matrix of same dimension. Print the result of multiplication, subtraction in R.

Answer:

```
x<-diag(10)

x

y<-matrix(1:100, nrow = 10,byrow=TRUE)

y

add<-x+y

print("Addition of two matrices")

add


multiply<-x*y

print("Multiplication of two matrices")
```

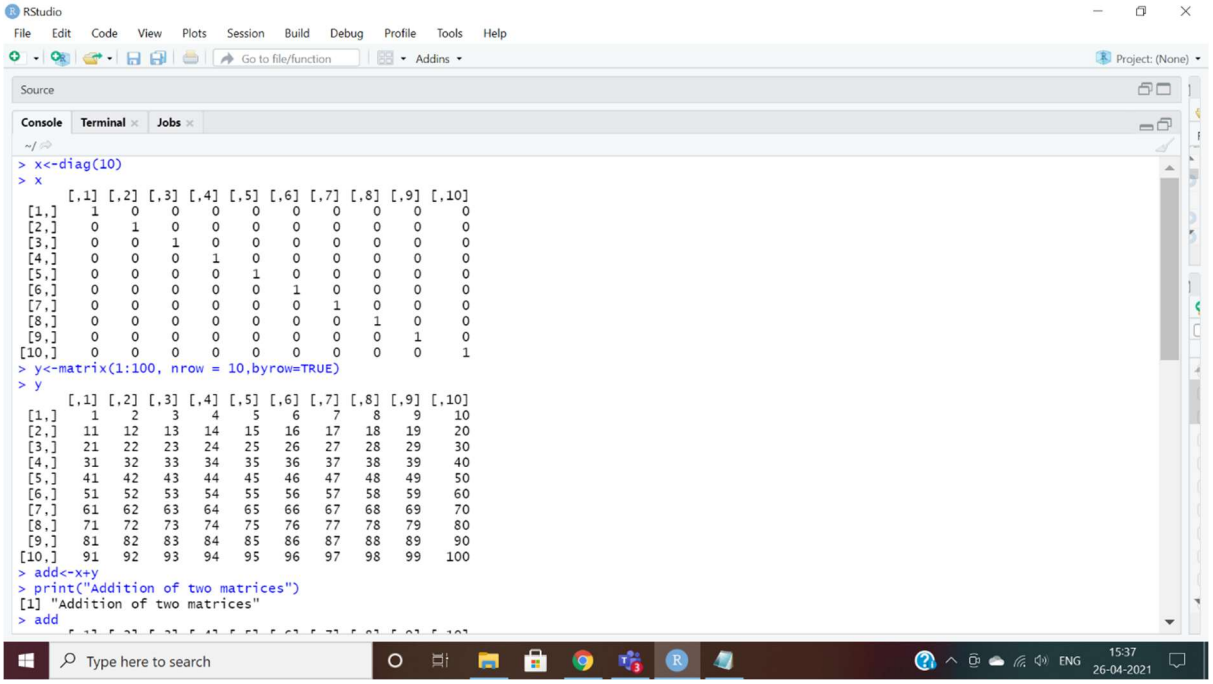
multiply

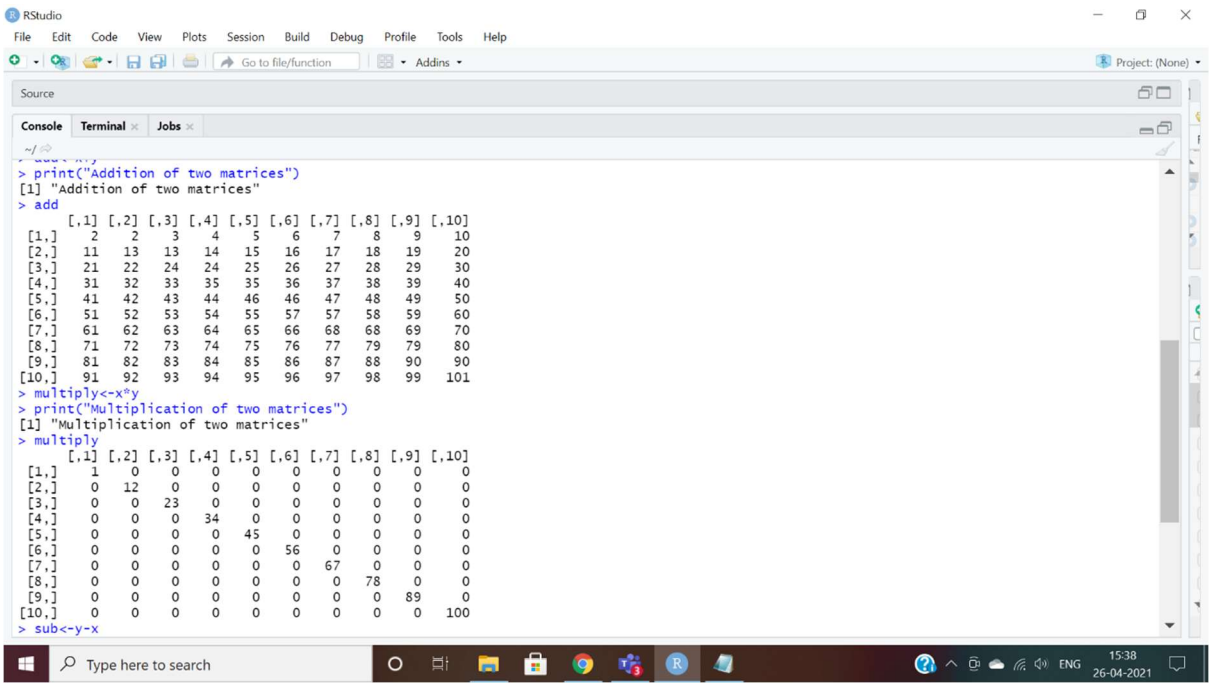
sub<-y-x

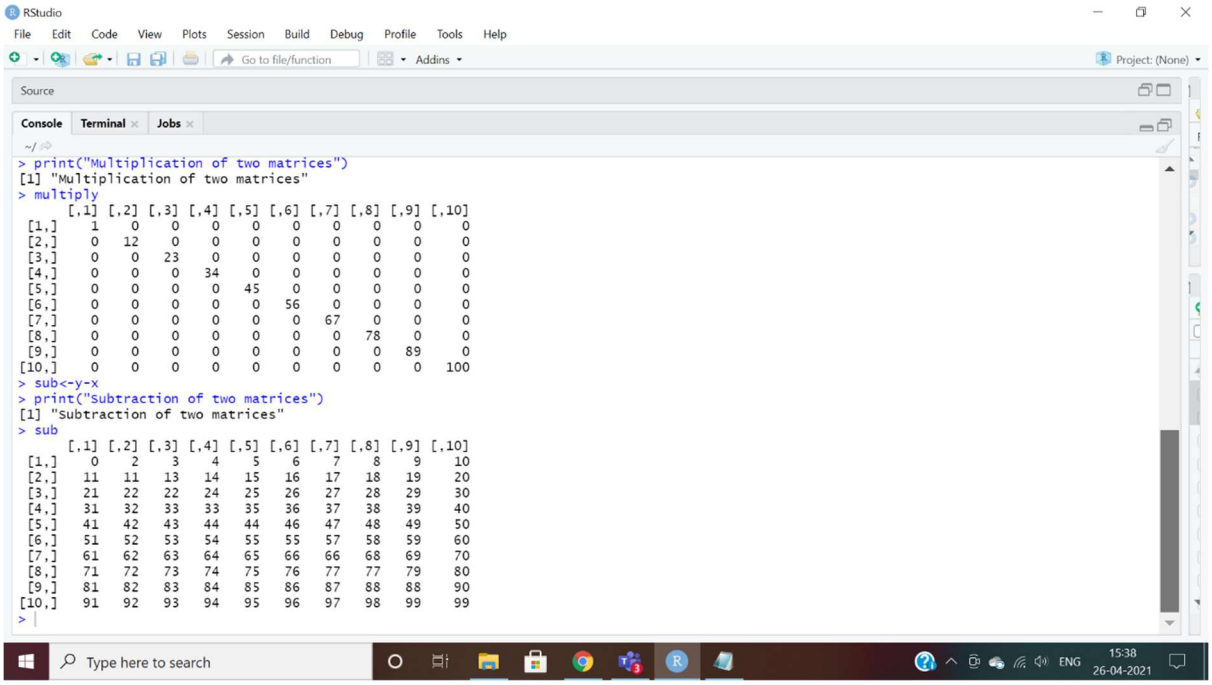
print("Subtraction of two matrices")

sub

OUTPUT







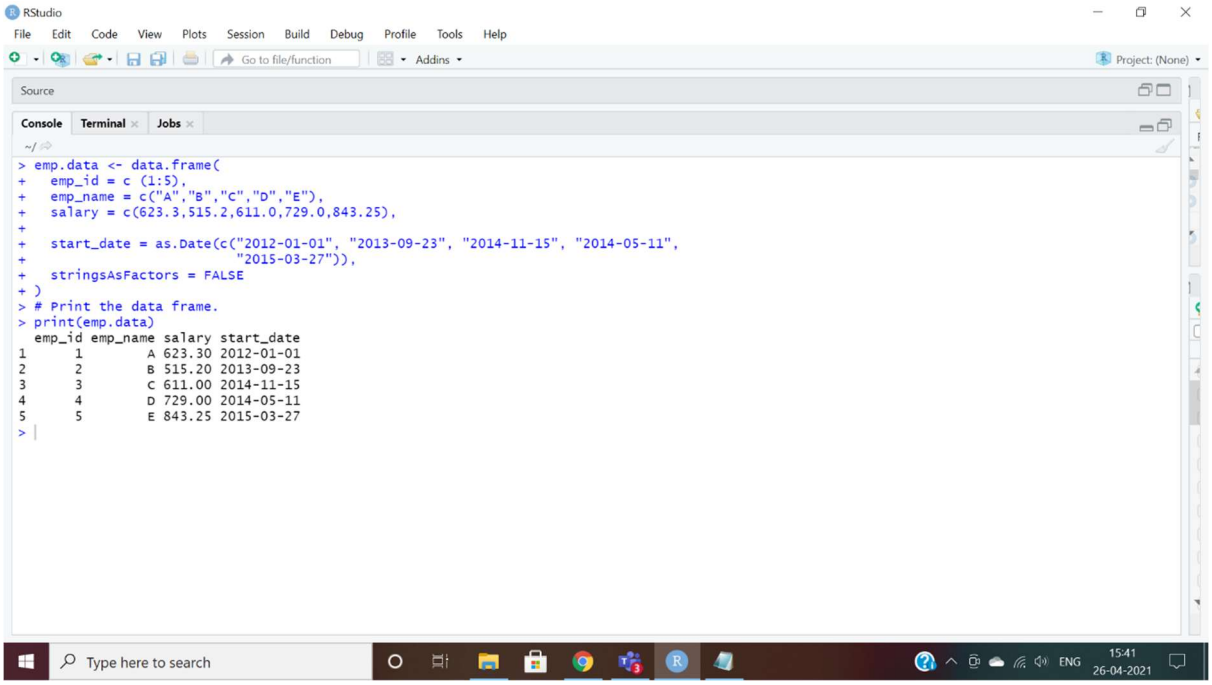
Q3. Write R script to create data frame "Emp" with fields of emp_id, emp_name, salary, and start_date: emp_id = c(1:5) emp_name = c("A","B","C","D","E") salary = c(623.3,515.2,611.0,729.0,843.25) start_date = as.Date(c("2012-01-01", "2013-09-23", "2014-11-15", "2014-05- 11", "2015-03-27")),

i)Print the structure of data frame.

Answer:

```
emp.data <- data.frame(
  emp_id = c (1:5),
  emp_name = c("A","B","C","D","E"),
  salary = c(623.3,515.2,611.0,729.0,843.25),

  start_date = as.Date(c("2012-01-01", "2013-09-23", "2014-11-15", "2014-05-11",
                         "2015-03-27")),
  stringsAsFactors = FALSE
)
# Print the data frame.
print(emp.data)
```

OUTPUT

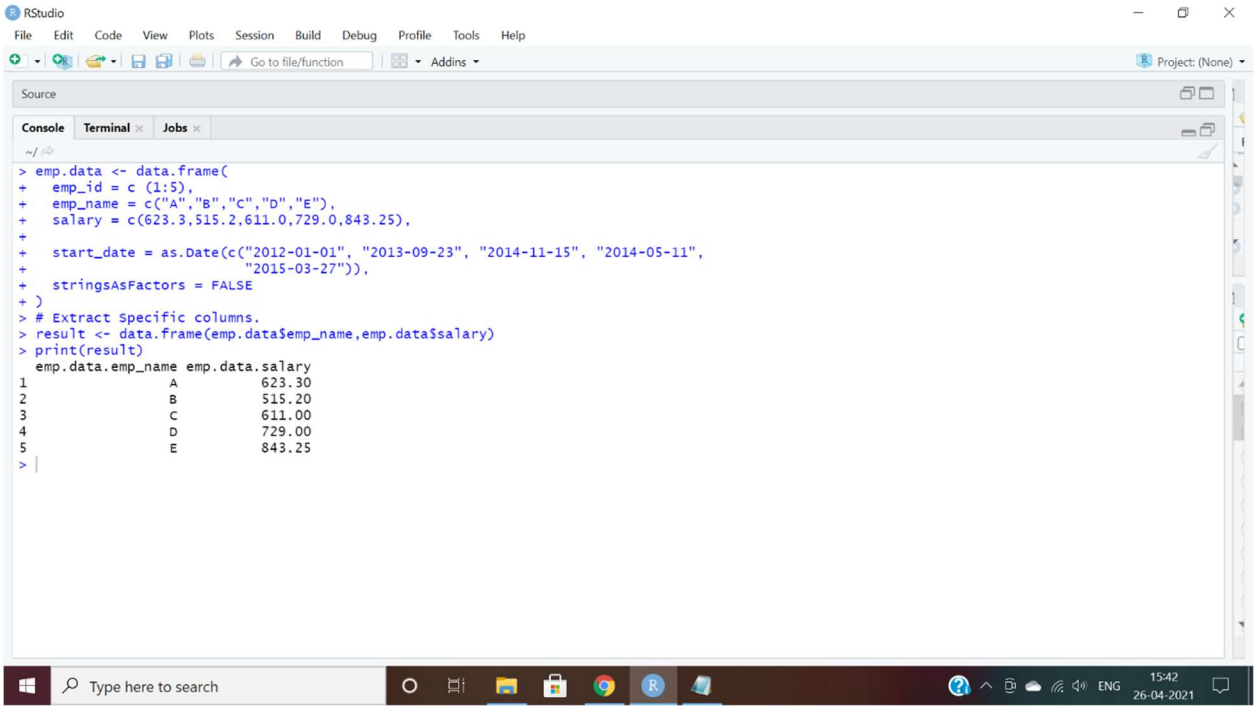


ii) Extract emp_name and salary columns.

Answer:

```
emp.data <- data.frame(
  emp_id = c (1:5),
  emp_name = c("A","B","C","D","E"),
  salary = c(623.3,515.2,611.0,729.0,843.25),


  start_date = as.Date(c("2012-01-01", "2013-09-23", "2014-11-15", "2014-05-11",
                         "2015-03-27")),
  stringsAsFactors = FALSE
)
# Extract Specific columns.
result <- data.frame(emp.data$emp_name,emp.data$salary)
print(result)
```

OUTPUT



Q4. In the following real-world data (airquality), we have considered few observations (Obs) and attributes.

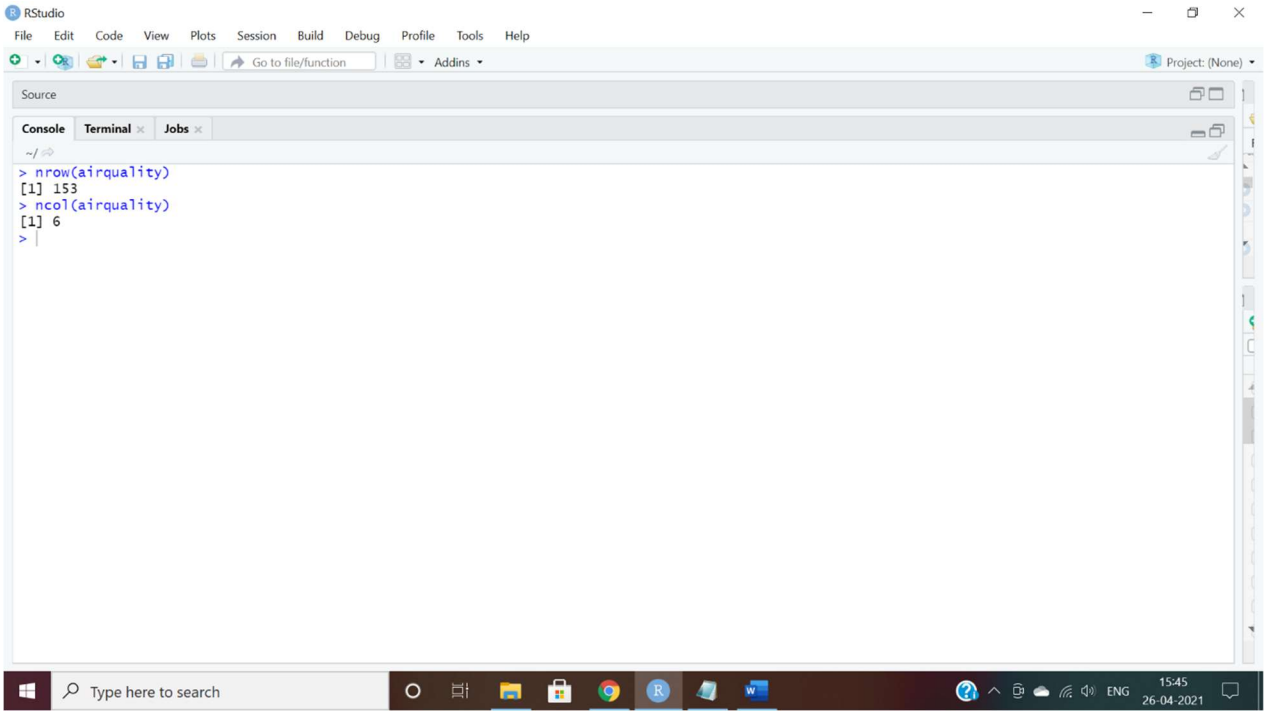
i)Write R syntax to print number of columns and rows in the data

Answer:

nrow(airquality)

ncol(airquality)

OUTPUT

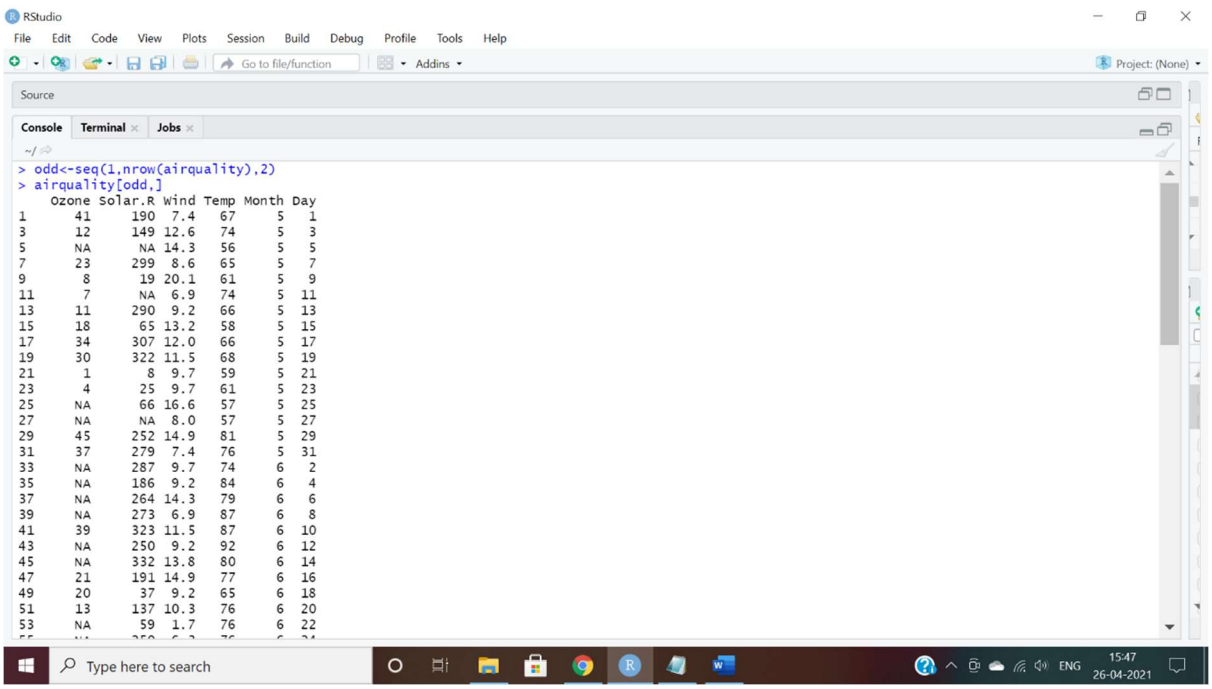


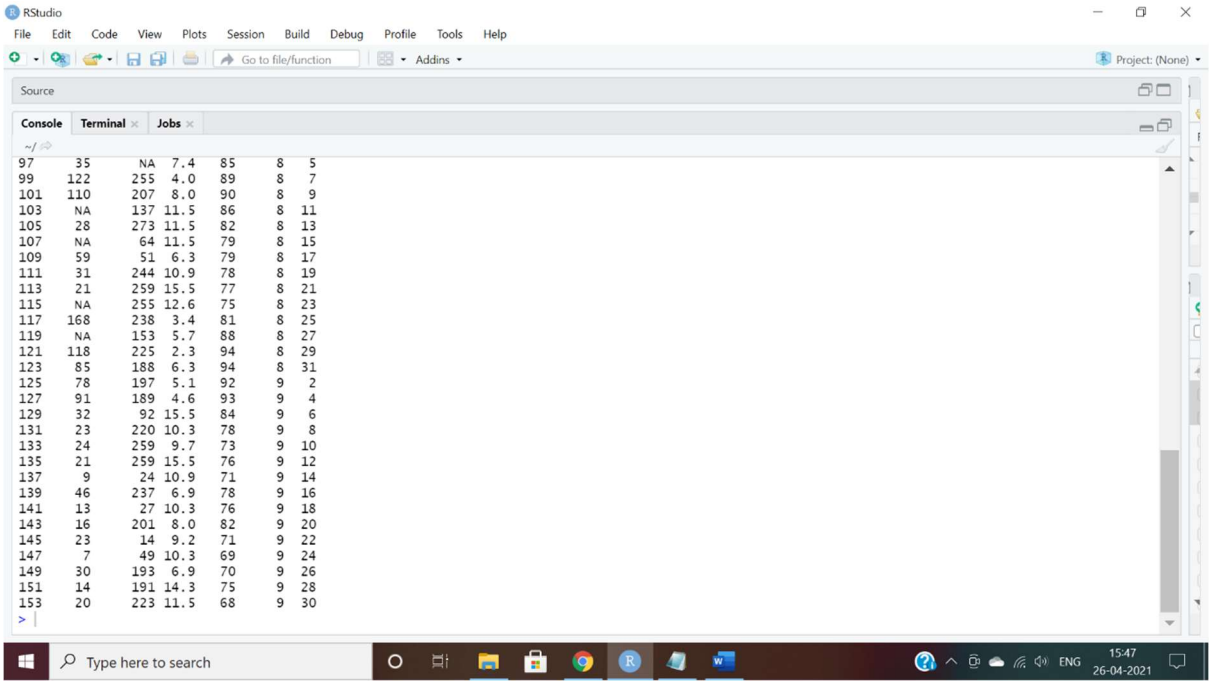
ii)Write R syntax to print all odd indexed rows for given data.

Answer:

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

airquality[odd,]
```

OUTPUT



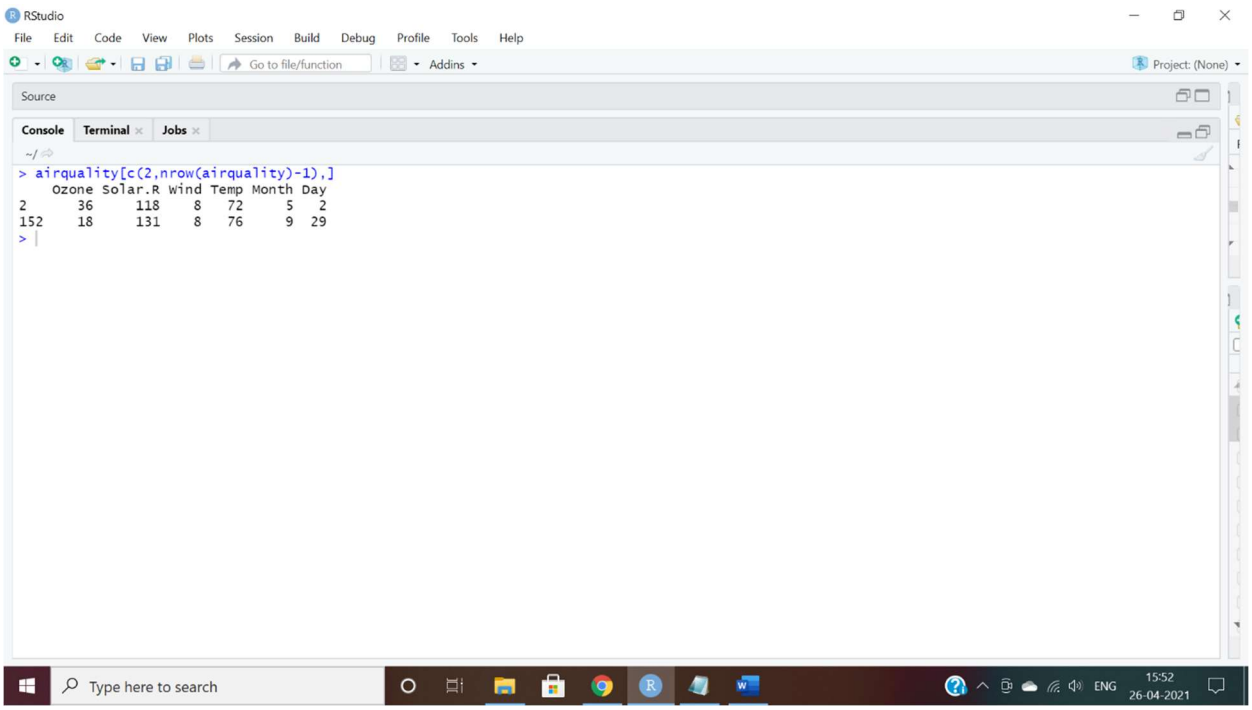


iii)Write R syntax to print second row and second last row for given data.

Answer:

airquality[c(2,nrow(airquality)-1),]

OUTPUT



iv) Write R syntax to print even and odd index column for given data.

Answer:

even

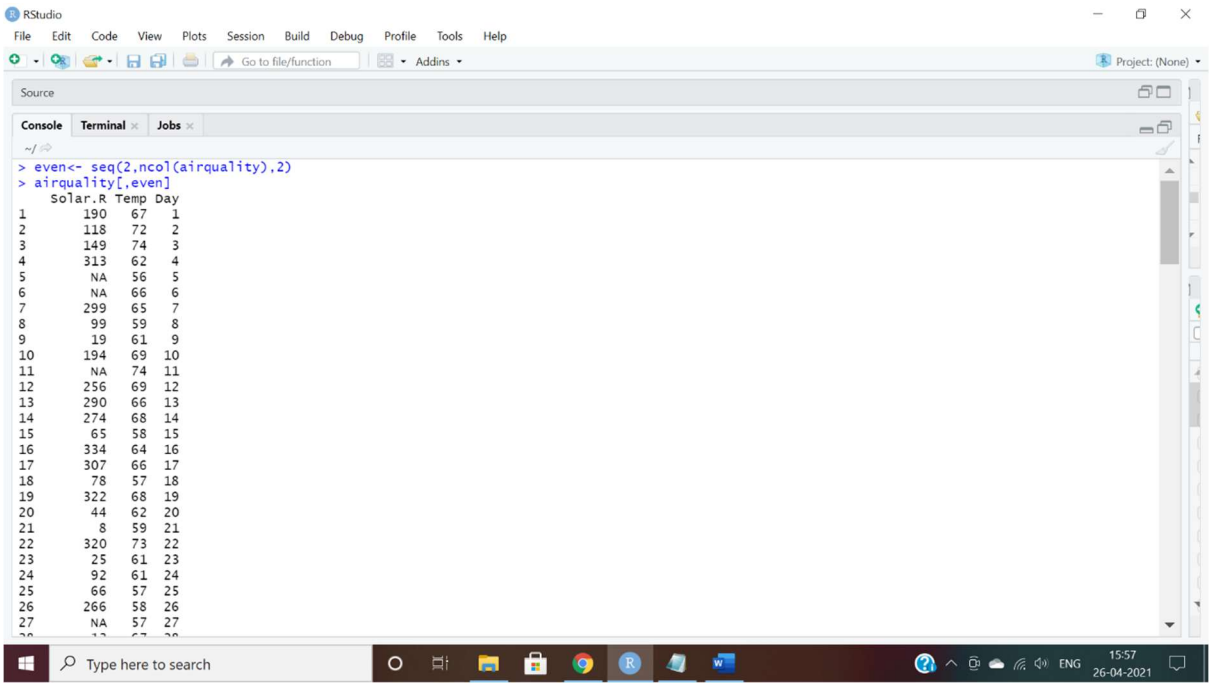
```
even<- seq(2,ncol(airquality),2)

airquality[,even]
```

odd

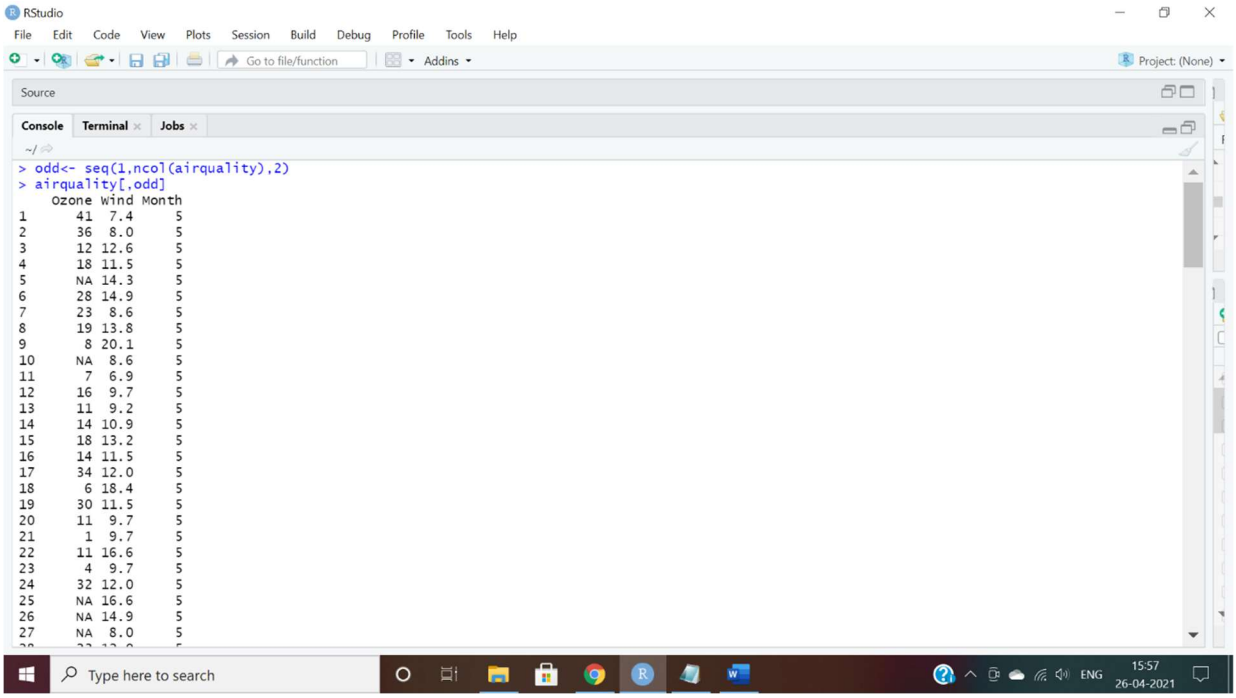
```
odd<- seq(1,ncol(airquality),2)

airquality[,odd]
```

OUTPUT

EVEN Columns



ODD Columns



Q5. Consider the data set "airquality" (mentioned in Q. 4) in R. · Write a command to draw a boxplot at the column as ozone.

Answer:

boxplot(airquality$Ozone)

OUTPUT