

ICS321 DATA WAREHOUSING AND DATA MINING

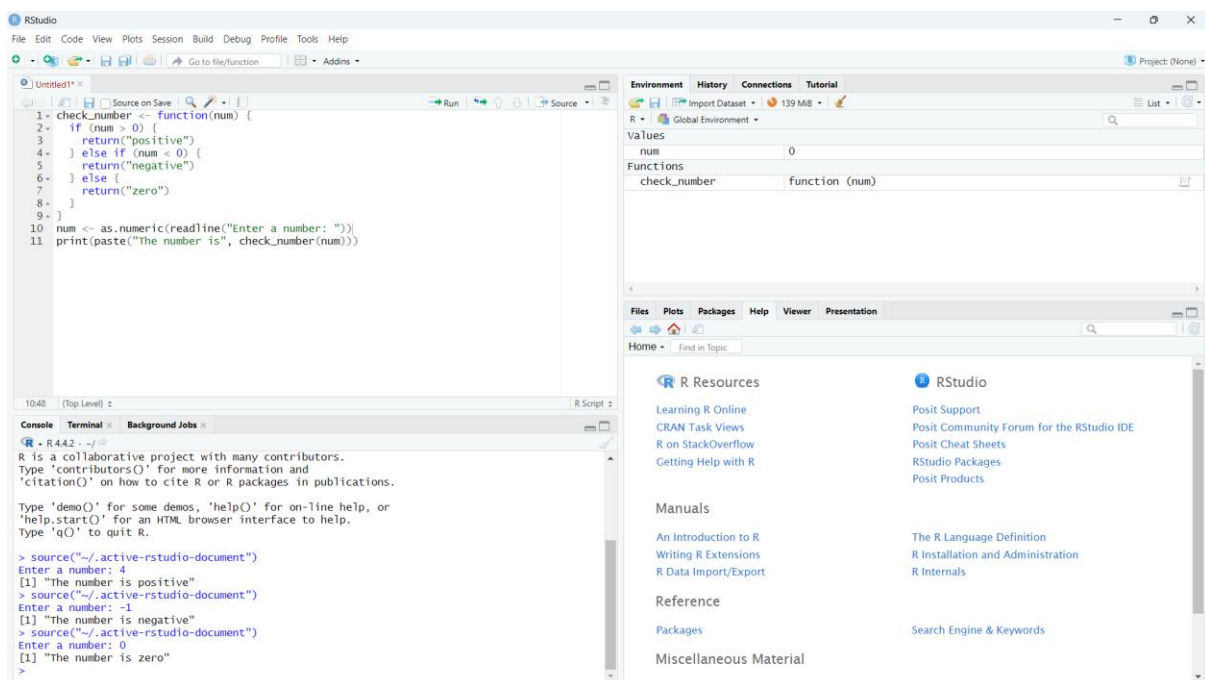
LAB 2 SUBMISSION -16/01/25

Name: Manohar Reddy Pulicharla,

Roll. No: 2022BCD0027.

1) Write a function that takes an integer as input and returns whether the number is **positive**, **negative**, or **zero**.

OUTPUT:



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

```
1- check_number <- function(num) {  
2-   if (num > 0) {  
3-     return("positive")  
4-   } else if (num < 0) {  
5-     return("negative")  
6-   } else {  
7-     return("zero")  
8-   }  
9- }  
10 num <- as.numeric(readline("Enter a number: "))  
11 print(paste("The number is", check_number(num)))
```

The console at the bottom shows the execution results for three inputs:

```
> source("~/active-rstudio-document")  
Enter a number: 4  
[1] "The number is positive"  
> source("~/active-rstudio-document")  
Enter a number: -1  
[1] "The number is negative"  
> source("~/active-rstudio-document")  
Enter a number: 0  
[1] "The number is zero"  
>
```

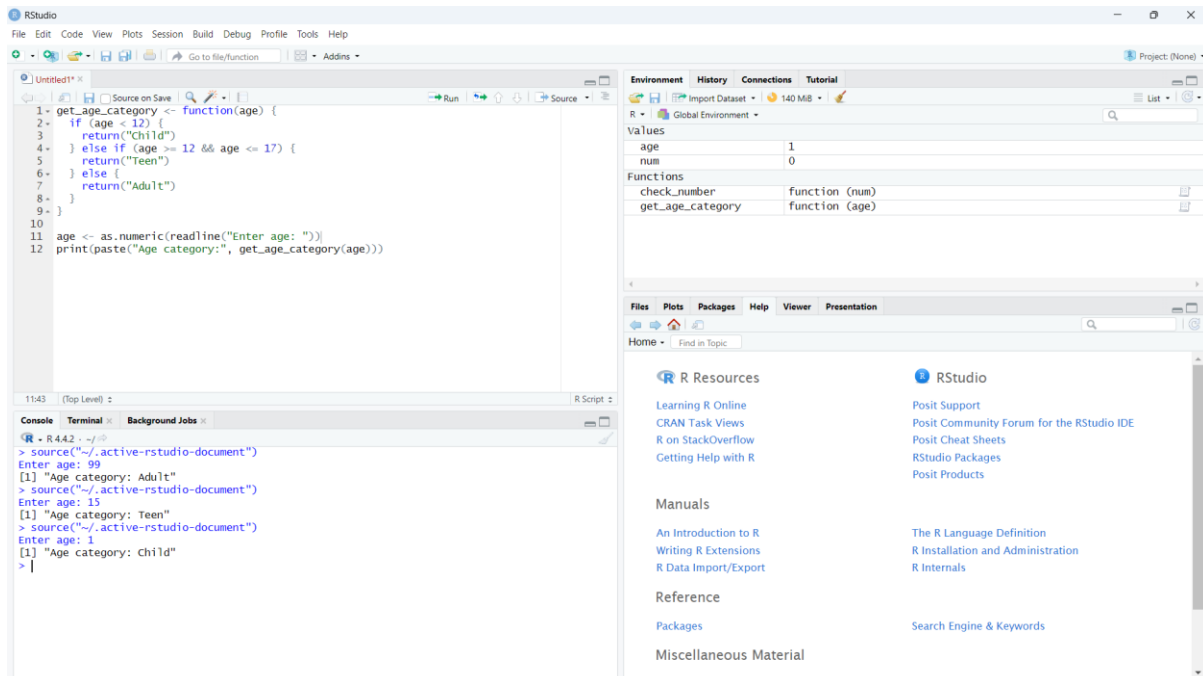
The Environment pane on the right shows the 'Global Environment' with a 'num' variable set to 0 and a 'check_number' function defined as 'function (num)'. The bottom right pane displays the RStudio home page with various resource links.

2) Write a function that checks the age of a person and returns the age category:

- **"Child"** if the age is less than 12,

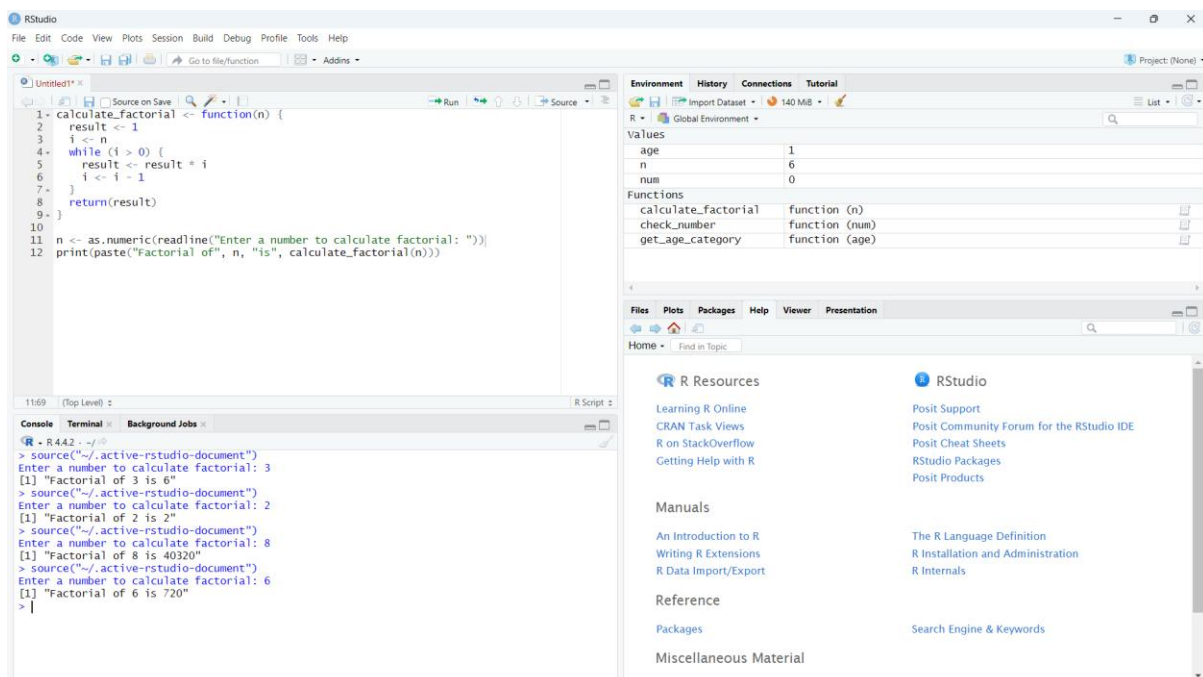
- **"Teen"** if the age is between 12 and 17 (inclusive),
- **"Adult"** if the age is 18 or older.

OUTPUT:



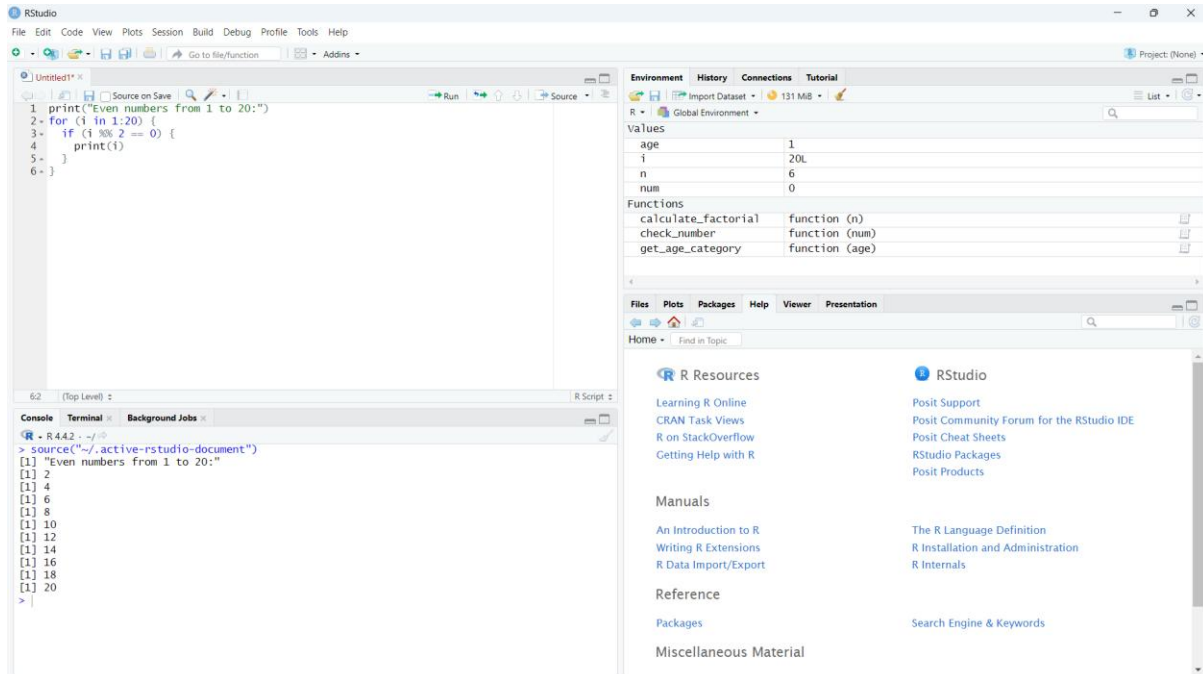
3) Write a while loop to calculate the factorial of a given number n (e.g., $5! = 5 * 4 * 3 * 2 * 1$).

OUTPUT:



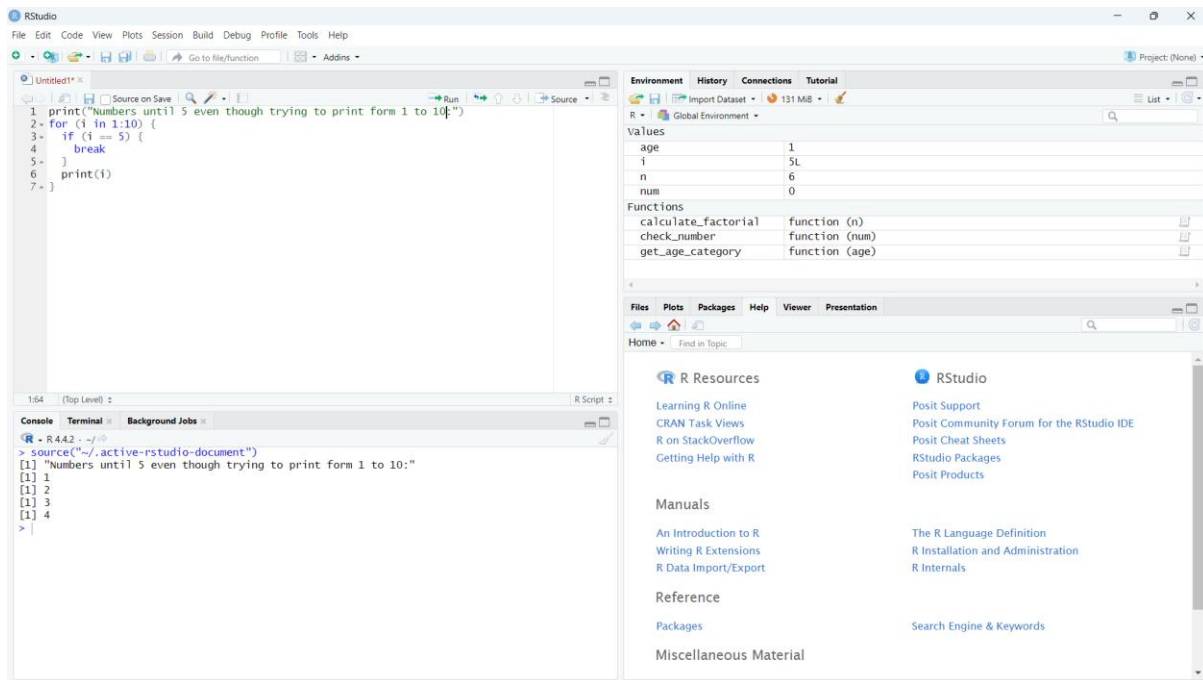
4) Write a for loop that prints all the even numbers from 1 to 20.

OUTPUT:



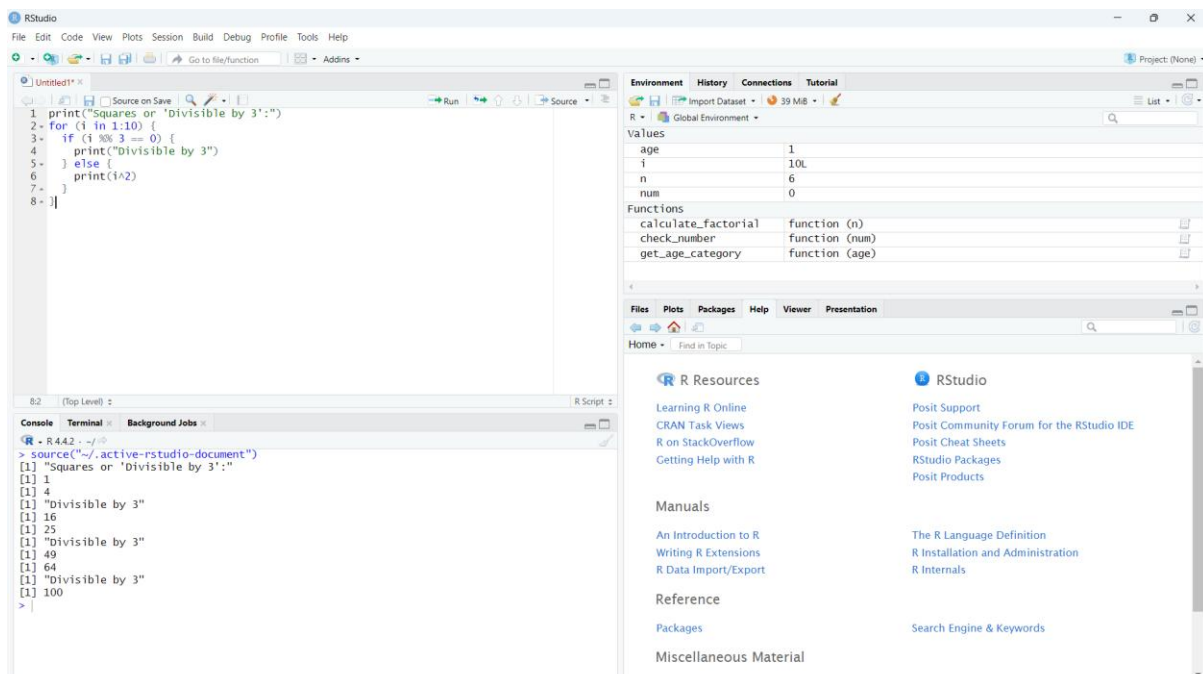
5) Write a for loop to print numbers from 1 to 10, but stop (using break) when the number 5 is reached.

OUTPUT:



6) Write a for loop that calculates and prints the squares of numbers from 1 to 10. However, for numbers that are divisible by 3, print "Divisible by 3" instead of the square.

OUTPUT:



7) Write a while loop that generates Fibonacci numbers and stops (using break) when a Fibonacci number exceeds 100.

OUTPUT:

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

```
1 print("Fibonacci numbers up to 100:")
2 a <- 0
3 b <- 1
4 while (TRUE) {
5   if (b > 100) {
6     break
7   }
8   print(b)
9   temp <- a + b
10  a <- b
11  b <- temp
12 }
```

The console shows the output of the script:

```
> source("~/active-rstudio-document")
[1] "Fibonacci numbers up to 100:"
[1] 1
[1] 1
[1] 2
[1] 3
[1] 5
[1] 8
[1] 13
[1] 21
[1] 34
[1] 55
[1] 89
>
```

The Environment pane on the right shows the following values:

Variable	Value
a	89
age	1
b	144
i	10L
n	6
num	0
temp	144

The Functions pane shows the following functions:

Function	Definition
calculate_factorial	function (n)
check_number	function (num)
get_age_category	function (age)

8) Write a for loop inside a while loop to print numbers from 1 to 10. If the current number is divisible by 4, use break to exit the for loop and print a message. Then, continue with the while loop.

OUTPUT:

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

```
1 counter <- 1
2 while (counter <= 3) {
3   print(paste("Iteration", counter))
4   for (i in 1:10) {
5     if (i % 4 == 0) {
6       print("Found number divisible by 4. Breaking inner loop.")
7       break
8     }
9     print(i)
10  }
11  counter <- counter + 1
12 }
```

The console shows the output of the script:

```
> source("~/active-rstudio-document")
[1] "Iteration 1"
[1] 1
[1] 2
[1] 3
[1] "Found number divisible by 4. Breaking inner loop."
[1] "Iteration 2"
[1] 1
[1] 2
[1] 3
[1] "Found number divisible by 4. Breaking inner loop."
[1] "Iteration 3"
[1] 1
[1] 2
[1] 3
[1] "Found number divisible by 4. Breaking inner loop."
>
```

The Environment pane on the right shows the following values:

Variable	Value
a	89
age	1
b	144
counter	4
i	4L
n	6
num	0
temp	144

The Functions pane shows the following functions:

Function	Definition
calculate_factorial	function (n)
check_number	function (num)
get_age_category	function (age)