

## Assignment 3

**Name:** Apurv Kulkarni

**ID:** 191080079

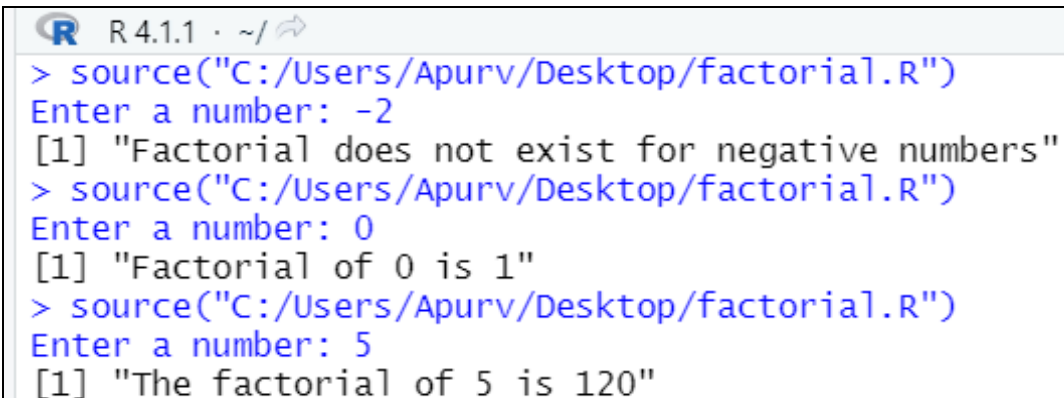
**Branch:** Information Technology

### 1. Write a program to find the factorial of a number using R.

#### Code:

```
n = readline(prompt="Enter a number: ")
n = as.integer(n)
ans = 1
if(n < 0) {
  print("Factorial does not exist for negative numbers")
} else if(n==0){
  print("Factorial of 0 is 1")
} else{
  for(i in 1 : n) {
    ans = ans * i
  }
  print(paste("The factorial of", n, "is", ans))
}
```

#### Output:



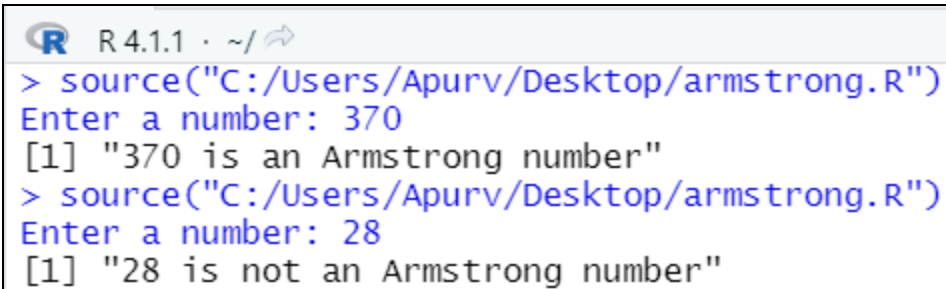
```
R 4.1.1 · ~/
> source("C:/Users/Apurv/Desktop/factorial.R")
Enter a number: -2
[1] "Factorial does not exist for negative numbers"
> source("C:/Users/Apurv/Desktop/factorial.R")
Enter a number: 0
[1] "Factorial of 0 is 1"
> source("C:/Users/Apurv/Desktop/factorial.R")
Enter a number: 5
[1] "The factorial of 5 is 120"
```

## 2. Write a program to find the Armstrong number using R.

### Code:

```
n = readline(prompt="Enter a number: ")
n = as.integer(n)
sum = 0
temp = n
while(temp > 0) {
  digit = temp %% 10
  sum = sum + (digit ^ 3)
  temp = floor(temp / 10)
}
if(n == sum) {
  print(paste(n, "is an Armstrong number"))
} else {
  print(paste(n, "is not an Armstrong number"))
}
```

### Output:



```
R 4.1.1 · ~/
> source("C:/Users/Apurv/Desktop/armstrong.R")
Enter a number: 370
[1] "370 is an Armstrong number"
> source("C:/Users/Apurv/Desktop/armstrong.R")
Enter a number: 28
[1] "28 is not an Armstrong number"
```

## 3. Write a program to check whether a number is even or odd using R.

### Code:

```
n = readline(prompt="Enter a number: ")
n = as.integer(n)
if(n%%2==0) {
  print(paste(n, "is even"))
} else {
  print(paste(n, "is odd"))
}
```

### Output:

```
R 4.1.1 · ~/
> source("C:/Users/Apurv/Desktop/evenOdd.R")
Enter a number: 11
[1] "11 is odd"
> source("C:/Users/Apurv/Desktop/evenOdd.R")
Enter a number: 16
[1] "16 is even"
```

4. Write a program to check whether a number is positive, negative, or zero using R.

### Code:

```
n = readline(prompt="Enter a number: ")
n = as.integer(n)
if(n<0) {
  print(paste(n, "is negative"))
} else if(n==0){
  print(paste("Number entered is 0"))
} else{
  print(paste(n, "is positive"))
}
```

### Output:

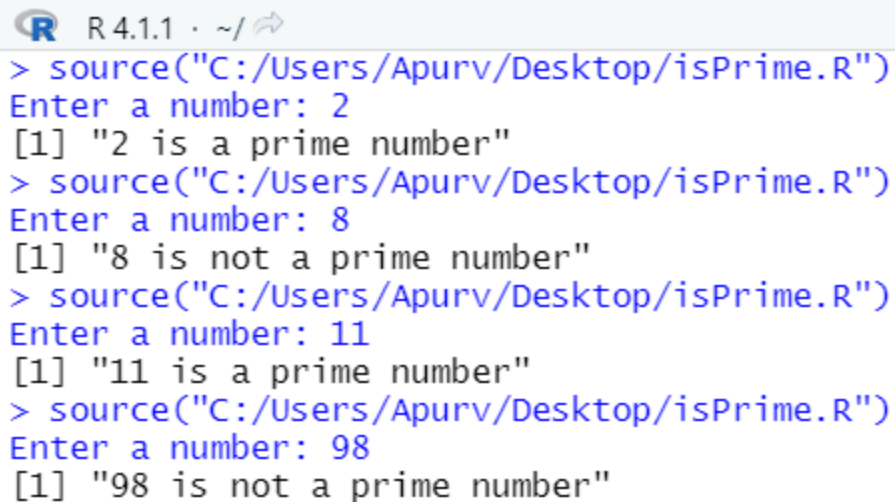
```
R 4.1.1 · ~/
> source("C:/Users/Apurv/Desktop/negPos.R")
Enter a number: -11
[1] "-11 is negative"
> source("C:/Users/Apurv/Desktop/negPos.R")
Enter a number: 0
[1] "Number entered is 0"
> source("C:/Users/Apurv/Desktop/negPos.R")
Enter a number: 11
[1] "11 is positive"
```

## 5. Write a program to find the prime number using R.

**Code:**

```
n = readline(prompt="Enter a number: ")
n = as.integer(n)
flag = 0
if(n > 1) {
  flag = 1
  for(i in 2:(n-1)) {
    if ((n %% i) == 0) {
      flag = 0
      break
    }
  }
}
if(n == 2) flag = 1
if(flag == 1) {
  print(paste(n,"is a prime number"))
} else {
  print(paste(n,"is not a prime number"))
}
```

**Output:**

A screenshot of an R console window showing the execution of the prime number program. The window title is 'R 4.1.1 · ~/'. The user enters the file path 'C:/Users/Apurv/Desktop/isPrime.R' and runs it four times with inputs 2, 8, 11, and 98. The output shows that 2 and 11 are prime, while 8 and 98 are not.


```
R 4.1.1 · ~/
> source("C:/Users/Apurv/Desktop/isPrime.R")
Enter a number: 2
[1] "2 is a prime number"
> source("C:/Users/Apurv/Desktop/isPrime.R")
Enter a number: 8
[1] "8 is not a prime number"
> source("C:/Users/Apurv/Desktop/isPrime.R")
Enter a number: 11
[1] "11 is a prime number"
> source("C:/Users/Apurv/Desktop/isPrime.R")
Enter a number: 98
[1] "98 is not a prime number"
```

## 6. Write a program to check the leap year using R.

**Code:**

```
year = readline(prompt="Enter a year: ")
year = as.integer(year)
if((year %% 4) == 0) {
  if((year %% 100) == 0) {
    if((year %% 400) == 0) {
      print(paste(year,"is a leap year"))
    } else {
      print(paste(year,"is not a leap year"))
    }
  } else {
    print(paste(year,"is a leap year"))
  }
} else {
  print(paste(year,"is not a leap year"))
}
```

**Output:**

A screenshot of an R console window. The title bar shows the R logo, version 4.1.1, and the file path ~/. The console displays four instances of the program being run. Each instance starts with a prompt to source a file, followed by a user input of a year, and then the program's output. The outputs are: "2000 is a leap year", "2001 is not a leap year", "2004 is a leap year", and "2006 is not a leap year".

```
R 4.1.1 · ~/
> source("C:/Users/Apurv/Desktop/isLeapYear.R")
Enter a year: 2000
[1] "2000 is a leap year"
> source("C:/Users/Apurv/Desktop/isLeapYear.R")
Enter a year: 2001
[1] "2001 is not a leap year"
> source("C:/Users/Apurv/Desktop/isLeapYear.R")
Enter a year: 2004
[1] "2004 is a leap year"
> source("C:/Users/Apurv/Desktop/isLeapYear.R")
Enter a year: 2006
[1] "2006 is not a leap year"
```

**7. Write a program to make a calculator with addition, subtraction, multiplication, and division operations.**

**Code:**

```
add <- function(x, y) {  
  return(x + y)  
}  
subtract <- function(x, y) {  
  return(x - y)  
}  
multiply <- function(x, y) {  
  return(x * y)  
}  
divide <- function(x, y) {  
  return(x / y)  
}  
  
print("Select operation.")  
print("1.Add")  
print("2.Subtract")  
print("3.Multiply")  
print("4.Divide")  
  
choice = as.integer(readline(prompt="Enter choice[1/2/3/4]: "))  
num1 = as.integer(readline(prompt="Enter first number: "))  
num2 = as.integer(readline(prompt="Enter second number: "))  
  
operator <- switch(choice,"+","-","*","/")  
  
result <- switch(choice, add(num1, num2), subtract(num1, num2), multiply(num1, num2),  
divide(num1, num2))  
  
print(paste(num1, operator, num2, "=", result))
```

## Output:

```
R 4.1.1 · ~/
> source("C:/Users/Apurv/Desktop/calculator.R")
[1] "Select operation."
[1] "1.Add"
[1] "2.Subtract"
[1] "3.Multiply"
[1] "4.Divide"
Enter choice[1/2/3/4]: 1
Enter first number: 2
Enter second number: 3
[1] "2 + 3 = 5"
> source("C:/Users/Apurv/Desktop/calculator.R")
[1] "Select operation."
[1] "1.Add"
[1] "2.Subtract"
[1] "3.Multiply"
[1] "4.Divide"
Enter choice[1/2/3/4]: 2
Enter first number: 2
Enter second number: 3
[1] "2 - 3 = -1"
> source("C:/Users/Apurv/Desktop/calculator.R")
[1] "Select operation."
[1] "1.Add"
[1] "2.Subtract"
[1] "3.Multiply"
[1] "4.Divide"
Enter choice[1/2/3/4]: 3
Enter first number: 2
Enter second number: 3
[1] "2 * 3 = 6"
> source("C:/Users/Apurv/Desktop/calculator.R")
[1] "Select operation."
[1] "1.Add"
[1] "2.Subtract"
[1] "3.Multiply"
[1] "4.Divide"
Enter choice[1/2/3/4]: 4
Enter first number: 4
Enter second number: 2
[1] "4 / 2 = 2"
```