Experiment No: 1   Date:16 - 01-2025
R Programming

Aim: Implement a simple calculator application using R

Theory:

A simple calculator is a device that has to do simple mathematical operations like
- Addition
- Subtraction
- Multiplication
- Division.
- Exponentiation
- Log
- Power

So to make a Calculator we need a choice to select the Operation and do that selected Operation to get the result.

In this R program, we take the operation choice and two numbers from the user into the variables **n1, n2, and choice** respectively. And the corresponding user-defined function is called as per the **choice**. Here we are using switch branching to execute a particular function. The choice operators **'+', '- ', '*',** and **'/ '** are used corresponding to user choices 1,2,3,4. The exp() and log() functions are used corresponding to choices 5, 6 and '^' operator is used for choice 7.

Use the key combination Ctrl+Shift+Enter to run the R script using Rstudio.

Program Printout:

```
add = function(n1, n2)
{
  return (n1 + n2)
}

subtract = function(n1, n2)
{
  return (n1 - n2)
}

multiply = function(n1, n2)
{
  return (n1 * n2)
}

divide = function(n1, n2)
{
  ifelse(n2==0,return ("Exception: Division By zero"),return (n1
/ n2))
}

exponentiation = function(n1)
{
  return (exp(n1))
}

logarithm = function(n1)
{
  if(n1 <= 0)
  {
      return("Error: Log of negative no")
  }
  return (base::log(n1, base = 10))
}

power = function(n1, n2)
{
```

```r
  return (n1 ^ n2)
}

repeat{
  cat("\n\n1. Addition\n2. Subtraction\n3. Multiplication\n4.
Divison\n5. Exponentiation\n6. Logarithm(base 10)\n7. Power\n8.
Exit\n\nEnter your choice: ")
  choice = as.integer(readline())

  if(!(choice %in% 1:8))
  {
     cat("\n\nInvalid choice!")
     next
  }
  else if(choice == 8) break

  n1 = as.integer(readline(prompt = "Enter a number n1: "))
  n2 = NULL

  if(choice %in% c(1, 2, 3, 4, 7)){
     n2 = as.integer(readline(prompt = "Enter a second number n2:
"))
  }


  result = switch(
     choice,
     add(n1, n2),
     subtract(n1, n2),
     multiply(n1, n2),
     divide(n1, n2),
     exponentiation(n1),
     logarithm(n1),
     power(n1, n2)
  )
  cat("\nResult = ",result)

}
```

Program Output:

```
1. Addition
2. Subtraction
3. Multiplication
4. Divison
5. Exponentiation
6. Logarithm(base 10)
7. Power
8. Exit

Enter your choice:
1
Enter a number n1: 22
Enter a second number n2: 55

Result =  77

1. Addition
2. Subtraction
3. Multiplication
4. Divison
5. Exponentiation
6. Logarithm(base 10)
7. Power
8. Exit

Enter your choice:
2
Enter a number n1: 23
Enter a second number n2: 55

Result =  -32
```

```
1. Addition
2. Subtraction
3. Multiplication
4. Divison
5. Exponentiation
6. Logarithm(base 10)
7. Power
8. Exit

Enter your choice:
3
Enter a number n1: 44
Enter a second number n2: -2

Result =  -88

1. Addition
2. Subtraction
3. Multiplication
4. Divison
5. Exponentiation
6. Logarithm(base 10)
7. Power
8. Exit

Enter your choice:
4
Enter a number n1: 55
Enter a second number n2: 0

Result =  Exception: Division By zero
```

```
1. Addition
2. Subtraction
3. Multiplication
4. Divison
5. Exponentiation
6. Logarithm(base 10)
7. Power
8. Exit

Enter your choice:
4
Enter a number n1: 99
Enter a second number n2: -3

Result =  -33

1. Addition
2. Subtraction
3. Multiplication
4. Divison
5. Exponentiation
6. Logarithm(base 10)
7. Power
8. Exit

Enter your choice:
5
Enter a number n1: 45

Result =  3.493427e+19
```

```
1. Addition
2. Subtraction
3. Multiplication
4. Divison
5. Exponentiation
6. Logarithm(base 10)
7. Power
8. Exit

Enter your choice:
6
Enter a number n1: -1

Result =  Error: Log of negative no
```

```
1. Addition
2. Subtraction
3. Multiplication
4. Divison
5. Exponentiation
6. Logarithm(base 10)
7. Power
8. Exit

Enter your choice:
6
Enter a number n1: 10000

Result =  4

1. Addition
2. Subtraction
3. Multiplication
4. Divison
5. Exponentiation
6. Logarithm(base 10)
7. Power
8. Exit

Enter your choice:
7
Enter a number n1: 13
Enter a second number n2: 3

Result =  2197
```

```
1. Addition
2. Subtraction
3. Multiplication
4. Divison
5. Exponentiation
6. Logarithm(base 10)
7. Power
8. Exit

Enter your choice:
8
> |
```

Conclusion: The experiment successfully implemented a simple calculator using R Programming.