

# Algorithms

**Q1. Write an algorithm to find whether a number is prime number.**

- 1.Start.
- 2.Read 'n'
- 3.Set  $i=1$  ,  $count=0$
- 4.If  $i \leq n$  then go to step 5  
else go to step 8
- 5.Check the condition  $n \% i == 0$   
If true then go to step 6 else go to step 7.
- 6.Set  $count=count+1$
7. $i=i+1$  go to step 4
- 8.Check count, if  $count=2$ , display " Prime number" else display "NOT Prime".
- 9.Stop.

**Q2. Create an algorithm that ask users for a day number (1-365) and outputs the corresponding day of the week assuming January 1<sup>st</sup> is Monday.**

- 1.Start
- 2.Ask the user to input a day number (1-365).
- 3.Calculate the day of the week using the formula:  $day\ number \% 7$
- 4.Map the result to the corresponding day of the week:
  - 0=Sunday
  - 1=Monday
  - 2=Tuesday
  - 3=Wednesday

4=Thursday

5=Friday

6=Saturday

5. Output the corresponding day of the week.

6. End

### **Q3. Algorithm to find GCD using Euclidean algorithm.**

1. Start

2. Input two numbers.

3. Read two numbers as a and b.

4. If  $b=0$ , return a as GCD.

Else replace a with b and b with remainder of  $a\%b$ .

5. Repeat step 4 until  $b=0$ .

6. The last non-zero remainder is GCD.

7. Stop.

## **Pseudocodes**

### **Q1. Pseudocode to find smallest among three given variables.**

Start

//Input

Three variables (a, b, c)

//Use if-else statement to find the smallest

If  $a < b$  and  $a < c$ :

Print smallest = a

```

    else if b<a and b<c:
        print smallest = b
    else smallest = c
//Print the result
    Print ("The smallest value is": smallest)
End

```

## **Q2. Pseudocode to subtract two numbers without using – operator.**

```

Function subtract (a, b)
    //Find the 2's complement of b
    First find 1's complement of b
    b complement=NOT (b)
    //Add 1 to the 1's complement to get the 2's complement
    b 2's complement=b complement+1
    //Add the 2's complement of b to a
    Result=a+b 2's complement
    //Output
    Print Result

```

## **Q3. Pseudocode for basic calculator that performs multiplication and division.**

```

Start
    Print "Enter first number"
    Print (1. Multiplication)
    Print (2. Division)

```

Print "Enter your choice (1/2)"

Print "Enter second number"

If choice is 1

Result = Multiply (Num1, Num2)

Print "Result"

Else if choice is 2

If Num2 != 0

Result = Divide (Num1, Num2)

Print "Result"

Else print "Error"

Print "Perform another calculation"

Print "Enter your choice (Yes/No)"

If Yes, go back to step 1

Else End