**CSD 1133 – 2023S  
Student ID:** 901142 **Student Name:** Roshan Shrestha **Assignment # 5, Pseudocode, and flowchart**

**---------------------------------------------------------------------------------------------------------------- Question:** RSA Numbers

When a credit card number is sent through the Internet it must be protected so that other people cannot see it. Many web browsers use a protection based on "RSA Numbers."

A number is an RSA number if it has exactly four divisors. In other words, there are exactly four numbers that divide into it evenly. For example, 10 is an RSA number because it has exactly four divisors (1, 2, 5, 10). 12 is not an RSA number because it has too many divisors (1, 2, 3, 4, 6, 12). 11 is not an RSA number either. There is only one RSA number in the range 10...12. Write a program that inputs a range of numbers and then counts how many.

numbers from that range are RSA numbers.

Program Output: Enter lower limit of range User Input: 10  
Program Output: Enter upper limit of range User Input: 12

Program Output: The number of RSA numbers between 10 and 12 is 1.

**Pseudocode:**

// Main module, the entry point of the program

Module Main()

//Declare variables for lower limit, upper limit, index, and count

Declare Integer lower\_limit

Declare Integer upper\_limit

Declare Integer index

Declare Integer count = 0

//Prompt the user to enter the lower limit for the range and store in lower\_limit variable

Display "Enter the lower limit for the range: "

Input lower\_limit

//Prompt the user to enter the upper limit for the range and store in upper\_limit variable

Display "Enter upper limit for the range: "

Input upper\_limit

// Set the initial value of the index to the lower limit

Set index = lower\_limit

//Iterate through the range from lower\_limit to upper\_limit

While index <= upper\_limit

//Declare a boolean variable to store if the number is an RSA number

Declare Boolean is\_rsa\_number = False

//Call the checkIfRSA module

Call checkIfRSA(is\_rsa\_number, index)

//Check if the number is an RSA number and increment the count if true

If is\_rsa\_number == True Then

Set count = count + 1

End If

//Increment the index to forward the loop to the next number in the range

Set index = index + 1

End While

//Display the count of RSA numbers found in the range

Display "The total count of RSA numbers between "+ lower\_limit + " and " + upper\_limit + " is " + count

End Module

// Module checkIfRSA, to determine if the passed index is RSA number

Module checkIfRSA(Boolean Ref is\_rsa\_number, Integer index)

//Declare variables for rsa\_index and inner\_counter

Declare Integer rsa\_index = 1

Declare Integer inner\_counter = 0

//Iterate from rsa\_index to index

While rsa\_index <= index

//Check if the current index is a divisor of the number

If index % rsa\_index == 0 Then

//Increment the inner\_counter if the current index is a divisor

Set inner\_counter = inner\_counter + 1

//Check if the number of divisors exceeds 4

If inner\_counter > 4 Then

//Set is\_rsa\_number to False if the number of divisors exceeds 4

Set is\_rsa\_number = False

End If

End If

//Move to the next divisor

Set rsa\_index = rsa\_index + 1

End While

//Check if the number has exactly 4 divisors

If inner\_counter == 4 Then

//Set is\_rsa\_number to True if the number has exactly 4 divisors

Set is\_rsa\_number = True

Else

//Set is\_rsa\_number to False if the number does not have exactly 4 divisors

Set is\_rsa\_number = False

End If

End Module

**Flow chart:**

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Description automatically generated

A screenshot of a computer

Description automatically generated with medium confidence

A screenshot of a cell phone

Description automatically generated with low confidence