Problem Statement: Find the given number is prime or not

Description: Natural number that’s divisible only by 1 and itself is prime. 2 is the first prime number It’s easy to say that 2, 3, 5 and 7 are prime numbers. Negative integers, 0, and 1 are not considered prime numbers. The list of the first few prime numbers are:

2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31

Test Cases:

|  |  |
| --- | --- |
| **Expected Input** | **Expected Output** |
| 5 | Prime Number |
| 24 | Not a prime number |
| 11 | Prime Number |
| 13 | Prime Number |
| 27 | Not a prime number |

Solution:

**Algorithm:**

**Pseudocode:**

START

i=2

while i<=num/2 THEN

if (num %i = 0 )

WRITE "Not a Prime number"

i=i+1

if (i=(num/2)+1) Then

Write "Prime number"

END

Trace Table:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| i | n | I<n | i/n=0 (false) | Result |
| 1 | 5 | 1<5 | 1/5 | false |
| 2 | 5 | 2<5 | 2/5 | false |
| 3 | 5 | 3<5 | 3/5 | false |
| 4 | 5 | 4<5 | 4/5 | false |
| 5 | 5 | 5=5 | 5/5 | true |
|  |  |  | Print(“Prime number”) |  |

Test Case:

If Number is Prime n=2

Step 1: Input number n=2

Step 2: Enters IF Loop (i=2; i<n;i++)

Step 3: 2 = 1, Goes to check condition 2<2 ..False

Step 4: Print “Prime number”

If number is even and composite n=4

Step 1: Input number n=4

Step 2: Enters IF Loop (i=2; i<n;i++)

Step 3: 2 = 1, Goes to check condition 2<4 ..False

Step 4: increment 1, i=2+1 =3

Step 4: Check if 4/2==0 , Returns true

Step 5: Print “Not Prime number”

If number is odd and composite n=3

Step 1: Input number n=3

Step 2: Enters IF Loop (i=2; i<n;i++)

Step 3: 2 = 1, Goes to check condition 2<3 ..False

Step 4: increment 1, i=2+1 =3

Step 4: Check if 3/2==1, Returns False

Step 5: increment 1, i=3+1 =4

Step 6: Check i< n , 4<3 Returns false

Step 7: Prints ‘Prime number’

If number is odd and composite n=1

Step 1: Input number n=1

Step 2: Enters IF Loop (i=2; i<n;i++)

Step 3: Goes to check condition 2<1 . False

Step 4: Print “Prime number”

Final Result:

|  |  |  |  |
| --- | --- | --- | --- |
| **Expected input** | **Expected output** | **Actual output** | **Test result** |
| 5 | Not a prime number | Not a prime number | **0** |
| 3 | Prime number | Prime number | **1** |
| 2 | Prime number | Prime number | **1** |
| 1 | Not a prime number | Not a prime number | **0** |
| 7 | Prime Number | Prime Number | **1** |
|  |  |  |  |