|  |  |  |
| --- | --- | --- |
| **Evaluation parameter** | **Does not meet specifications** | **Meets specifications** |
| **Problem statement** |  |  |
| Problem Statement must be clearly defined |  |  |
| Expected input and output formats must be described |  |  |
| Explain the problem statement with an example(if applicable) |  |  |
| **Expected input & output** |  |  |
| Minimum of 5 test cases (if applicable) |  |  |
| Coverage |  |  |
| Border condition |  |  |
| Unexpected inputs |  |  |
| **Solution** |  |  |
| The correctness of the solution. |  |  |
| Check for all the elements (tokens) of the problem (Assignment, Arithmetic, conditional, relational, input, output etc) |  |  |
| **Trace Table :** |  |  |
| Columns are variables, conditions, print statements |  |  |
| Order |  |  |
| Trace table for each function(If applicable) |  |  |
| labeling the columns |  |  |
| Coverage (conditions, iterations... etc) |  |  |
| **Final Result** |  |  |
| Executable File Submission |  |  |
| **Executable File** |  |  |
| Check with all test cases |  |  |

**Problem Statement:** Multiply two numbers using Ethiopian multiplication method

**Explanation: We multiply two numbers using the Ethopian multiplication method. This method is also called as Egyptian method. Let us consider two numbers. Say m and n.**

**M \* N is multiplied using this method.**

* **M is halfed and n is doubled.**
* **M is halfed until 1 is reached**
* **N is doubled till 1 is reached**
* **Wherever M is even, N is not considered**
* **The sum of N numbers is done.**

**Algorithm** :

To determine vowels in a String, follow these steps:

Step 1: Start

Step 2: Read the input number m and n.

Step 2.1: Set sum=0

Step 3: Check if m>=1

Step 3.1: If (m%2=1) then sum=sum+n go to step 4

Step 4: m=floor(m/2) (ie: decimal numbers are not considered 4.5=4)

Step 4.1: n=n\* 2 , n is doubled till m is 1

Step 5: Output value of sum

Step 6: End

**Pseudocode:**

**Trace table:**

Test Case 1: m=10,n=60

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **m** | **n** | **sum** | **m>=1** | **M=floor(m/2)** | **N=n\*2** | **Sum=sum+n** | **M%2=** |  |
| 10 | 60 | 0 | 10>=1 | 10=|\_10/2\_|=5 | 60\*2=120 | 0+120=120 | 0 | 0 |
| 5 | 120 | 120 | 5>=1 | 5=|\_5/2\_|=3 | 120\*2=240 | 120+120 | 1 | 120 |
| 3 | 240 | 240 | 3>=1 | 3=|\_3/2\_|=1 | 240\*2=480 | 240+240 | 1 | 120+240 |
| 1 | 480 | 480 | **1>=1** |  |  |  | 1 | 120+240+480 |
|  |  |  |  |  |  |  |  | 6**00** |
|  |  |  |  |  |  |  |  |  |

Test Case 2: 100, 6

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **m** | **n** | **sum** | **m>=1** | **M=floor(m/2)** | **N=n\*2** | **Sum=sum+n** | **M%2=** |  |  |
| 100 | 6 | 0 | 1 | 50 | 12 | 6 | 0 | 0 |  |
| 50 | 12 | 12 | 1 | 25 | 24 | 24 | 0 | 0 |  |
| 25 | 24 | 24 | 1 | 12.5 | 48 | 48 | 1 | 24 |  |
| 5 | 48 | 48 | 1 | 2.5 | 96 | 96 | 1 | 24+48 |  |
| 2 | 96 | 96 | 1 | 1 | 192 | 192 | 0 |  |  |
| 1 | 192 | 192 | 0 |  | 384 | 384 | 1 | 364 |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |

Test Case 3: 35 , 78

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **m** | **n** | **sum** | **m>=1** | **M=floor(m/2)** | **N=n\*2** | **Sum=sum+n** | **M%2=** | **Result** |
| 35 | 78 | 0 | 1 | 18 | 156 | 78 | 1 | 78 |
| 18 | 156 | 12 | 1 | 9 | 312 | 168 | 0 | 0 |
| 9 | 312 | 24 | 1 | 5 | 624 | 336 | 1 | 336 |
| 5 | 624 | 48 | 1 | 3 | 1248 | 672 | 1 | 672 |
| 3 | 1248 | 96 | 1 | 2 | 2496 | 1344 | 1 | 1344 |
| 2 | 2496 | 192 | 0 | 1 | 4992 | 2688 | 0 | 0 |
|  |  |  |  |  |  |  |  | 2626 |

Test Case 4: m=625 , 736

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **m** | **n** | **sum** | **m>=1** | **M=floor(m/2)** | **N=n\*2** | **Sum=sum+n** | **M%2=** | **Result** |  |
| 625 | 736 | 0 | 1 | 313 | 1472 | 736 | 1 | 736 |  |
| 313 | 1472 | 12 | 1 | 157 | 2944 | 1484 | 1 | 1472 |  |
| 157 | 2944 | 24 | 1 | 79 | 5888 | 2968 | 1 | 2944 |  |
| 79 | 5888 | 48 | 1 | 40 | 11776 | 5936 | 1 | 5888 |  |
| 40 | 11776 | 96 | 1 | 20 | 23552 | 11872 | 0 | 0 |  |
| 20 | 23552 | 192 | 0 | 10 | 47104 | 23744 | 0 | 0 |  |
|  |  |  |  |  |  |  |  | 11040 |  |

Test Case 5: m=1000, n=7362

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **m** | **n** | **sum** | **m>=1** | **M=floor(m/2)** | **N=n\*2** | **Sum=sum+n** | **M%2=** | **Result** |
| 1000 | 7362 | 0 | 1 | 500 | 14724 | 7362 | 0 | 0 |
| 500 | 14724 | 12 | 1 | 250 | 29448 | 14736 | 0 | 0 |
| 250 | 29448 | 24 | 1 | 125 | 58896 | 29472 | 0 | 0 |
| 125 | 58896 | 48 | 1 | 63 | 117792 | 58944 | 1 | 58896 |
| 63 | 117792 | 96 | 1 | 32 | 235584 | 117888 | 1 | 117792 |
| 32 | 235584 | 192 | 0 | 16 | 471168 | 235776 | 0 | 0 |
|  |  |  |  |  |  |  |  |  |

**Final Result:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Expected input** | **Expected output** | **Actual output** | **Test result** |
|  |  |  |  |
| 10, 6 | 60 | 60 | 60 |
| 100, 6 | 600 | 600 | 600 |
| 35 , 78 | 2730 | 2730 | 2730 |
| 625 , 736 | 460000 | 460000 | 460000 |
| 1000, 7362 | 7362000 | 7362000 | 7362000 |
|  |  |  |  |

Executable file:

