**Theory:**

The meaning of the word “inverse” is something opposite in effect. The multiplicative inverse of a number is a number that, when multiplied by the given number, gives 1 as the product. By multiplicative inverse definition, it is the reciprocal of a number. The multiplicative inverse of a number “a” is represented as a-1 or (1/a).

The multiplicative inverse property states that if we multiply a number with its reciprocal, the product is always equal to 1. The image given below shows that (1/a) is the reciprocal of the number “a”.

A pair of numbers, when multiplied to give product 1, are said to be multiplicative inverses of each other. Here, a and (1/a) are reciprocals of each other.

|  |  |
| --- | --- |
| 0 | - |
| 1 | 1 |
| 2 | - |
| 3 | 3 |
| 4 | - |
| 5 | 5 |
| 6 | - |
| 7 | 7 |

Multiplicative inverse modulo 8

**Programming Language: C**

**IDE: VS-Code**

**Code :**

#include <stdio.h>

int gcd(int n1, int n2)

{

if (n2 != 0)

return gcd(n2, n1 % n2);

else

return n1;

}

void main()

{

int s, m, i, num, MI, j;

printf("Enter the modulo value:\n");

scanf("%d", &m);

for (j = 0; j < m; j++)

{

if (gcd(j, m) == 1)

{

for (i = 1; i <= j; i++)

{

s = ((i \* m) + i);

MI = s % m;

if (MI % j == 0)

{

break;

}

}

printf("Multiplicative inverse of %d is %d\n", j, MI);

}

else

{

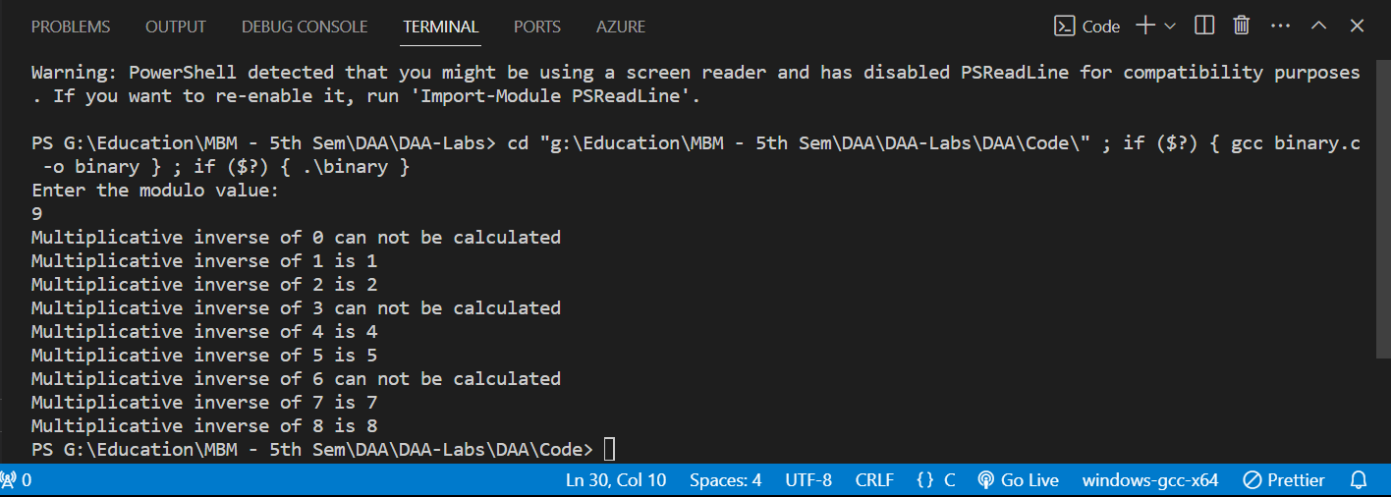
printf("Multiplicative inverse of %d can not be calculated\n", j);

}

}

}

**Output**

****