3.write a c program to solve a system of linear congruences by applying the Chinese Remainder Theorem.

#include <stdio.h>

int mul\_inv(int a, int b)

{

int b0 = b, t, q;

int x0 = 0, x1 = 1;

if (b == 1) return 1;

while (a > 1) {

q = a / b;

t = b, b = a % b, a = t;

t = x0, x0 = x1 - q \* x0, x1 = t;

}

if (x1 < 0) x1 += b0;

return x1;

}

int chinese\_remainder(int \*n, int \*a, int len)

{

int p, i, prod = 1, sum = 0;

for (i = 0; i < len; i++) prod \*= n[i];

for (i = 0; i < len; i++) {

p = prod / n[i];

sum += a[i] \* mul\_inv(p, n[i]) \* p;

}

return sum % prod;

}

int main(void)

{

int n[] = { 3, 5, 7 };

int a[] = { 2, 3, 2 };

printf("%d\n", chinese\_remainder(n, a, sizeof(n)/sizeof(n[0])));

return 0;

}

**Output:**

