5.จงนำโปรแกรมภาษาแอสเซมบลีสำหรับคำนวณค่า mod ในการทดลองที่7 มาเรียกใช้ผ่านโปรแกรมภาษา C

```c
#include<stdio.h>
int main(){
    int a,b,c;
    printf("A : ");
    scanf("%d", &a);
    printf("B : ");
    scanf("%d", &b);
    c = mod_func(a,b);
    printf("%d mod %d in Assembly = %d\n",a,b,c);
    printf("%d mod %d in c = %d",a,b,a%b);
return 0;
}
```

```
1       .global mod_func
2   mod_func:
3           MOV R6,#0 @ A>=0 , R6 = 0
4           CMP R0,#0 @cmp A,0
5           BGE else1 @if A>=0 to else1
6           MOV R6,#1 @ A<0 , R6=1
7           MOV R5,#-1
8           MUL R0,R0,R5 @ A=A*(-1)
9       else1:
10          CMP R1,#0 @cmp B,0
11          BGE end @if B >= 0 to end
12          MOV R5,#-1
13          MUL R1,R1,R5
14      end:
15      while:
16          CMP R0,R1 @cmp A,B
17          BLT endW @if A<B to endW
18          SUB R0,R0,R1 @A=A-B
19          B while
20      endW:
21          CMP R6,#0
22          BEQ endRe @if A = 0 to pos (A is positive)
23          MOV R4,#-1
24          MUL R0,R0,R4 @R3=R3*(-1) ,result
25          B endRe
26      endRe:
27      BX LR
28
```

แปลงจากลบเป็นบวก

mod

```
EX
A : -995415
B : 4514
-995415 mod 4514 in Assembly = -2335
-995415 mod 4514 in c = -2335
Process returned 0 (0x0)   execution time : 15.722 s
Press ENTER to continue.
```

6.จงนำโปรแกรมภาษาแอสเซมบลีสำหรับคำนวณค่า GCD ในการทดลองที่ 7 มาเรียกใช้ผ่านโปรแกรมภาษา C

```
    .global gcd_func
gcd_func:
        MOV R6,#0

        CMP R0,#0 @cmp A,0
        BGE else1 @if A>=0 go to else1
        MOV R6,#1 @ A<0 -> R6=1
        MOV R5,#-1
        MUL R0,R0,R5 @ A=A*(-1)
    else1:
        CMP R1,#0 @cmp B,0
        BGE end @if B >= 0 to end
        MOV R5,#-1
        MUL R1,R1,R5 @B = B*(-1)
    end:

    gcd:
        CMP R0,R1 @cmp A,B
        BEQ endGcd @ if A=B go to endGcd
        CMP R0,R1 @cmp A,B
        BLE elseGcd @if A<=B go to elseGcd
        SUB R0,R0,R1 @A=A-B if A>B
        b gcd
    elseGcd:
        SUB R1,R1,R0 @B=B-A if B>=A
        b gcd
    endGcd:
        BX LR
```

แปลงจากลบเป็นบวก

GCD

```c
#include<stdio.h>
int main(){
    int a,b,c;
    printf("A : ");
    scanf("%d", &a);
    printf("B : ");
    scanf("%d", &b);
    int a1=a;
    int b1=b;
    c = gcd_func(a,b);
    printf("GCD of %d and %d in Assembly = %d\n",a1,b1,gcd_func(a1,b1));
    printf("GCD of %d and %d in c = %d",a,b,gcd(a,b));
return 0;
}

int gcd(int n1,int n2){
    n1 = ( n1 > 0) ? n1 : -n1;
    n2 = ( n2 > 0) ? n2 : -n2;
    while(n1!=n2)
    {
        if(n1 > n2)
            n1 -= n2;
        else
            n2 -= n1;
    }
    return n1;
}
```

```
EX
A : 9999
B : -9
GCD of 9999 and -9 in Assembly = 9
GCD of 9999 and -9 in c = 9
Process returned 0 (0x0)   execution time : 6.851 s
Press ENTER to continue.
```