CSE433 embedded systems

#Project01

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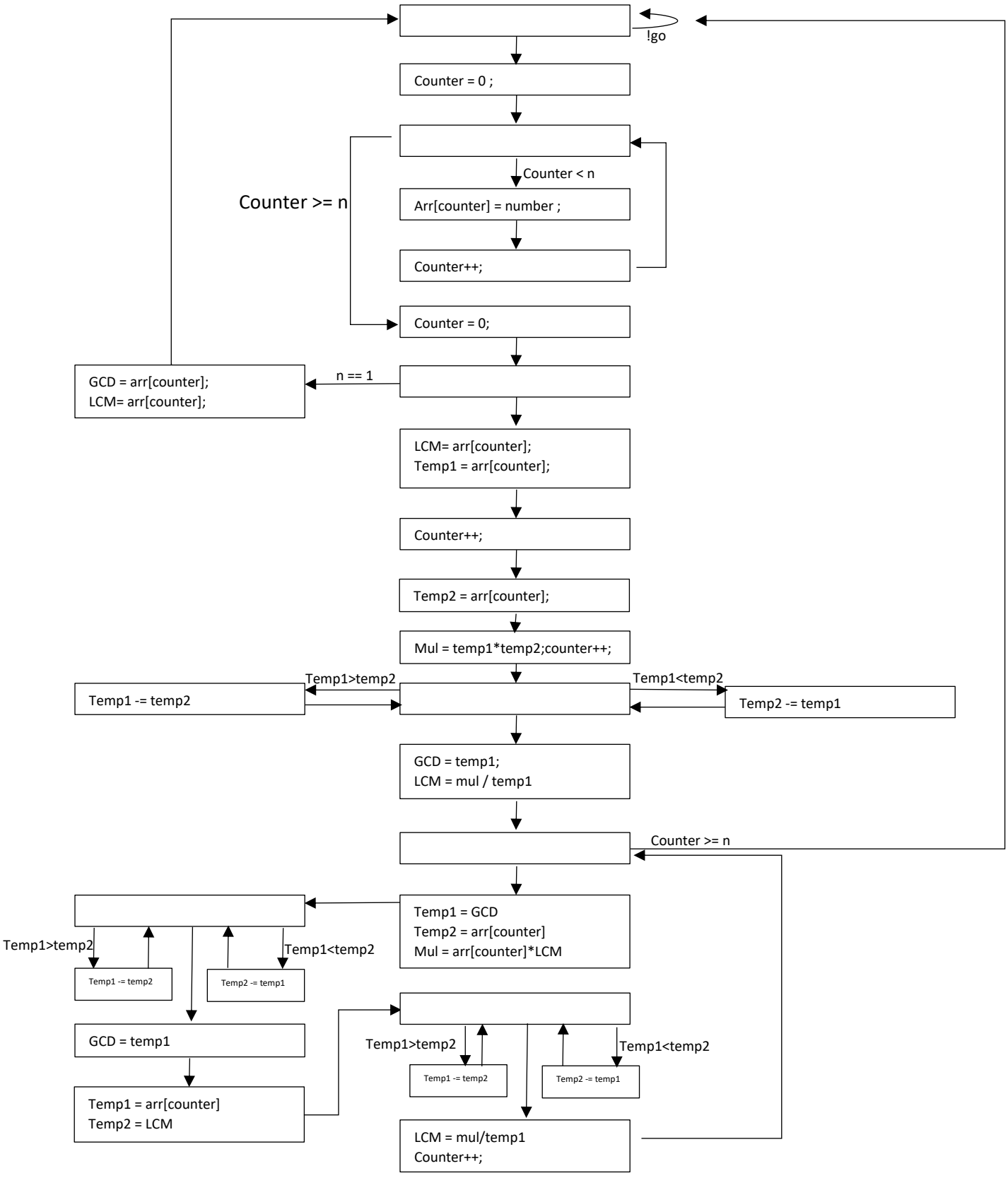
C code :

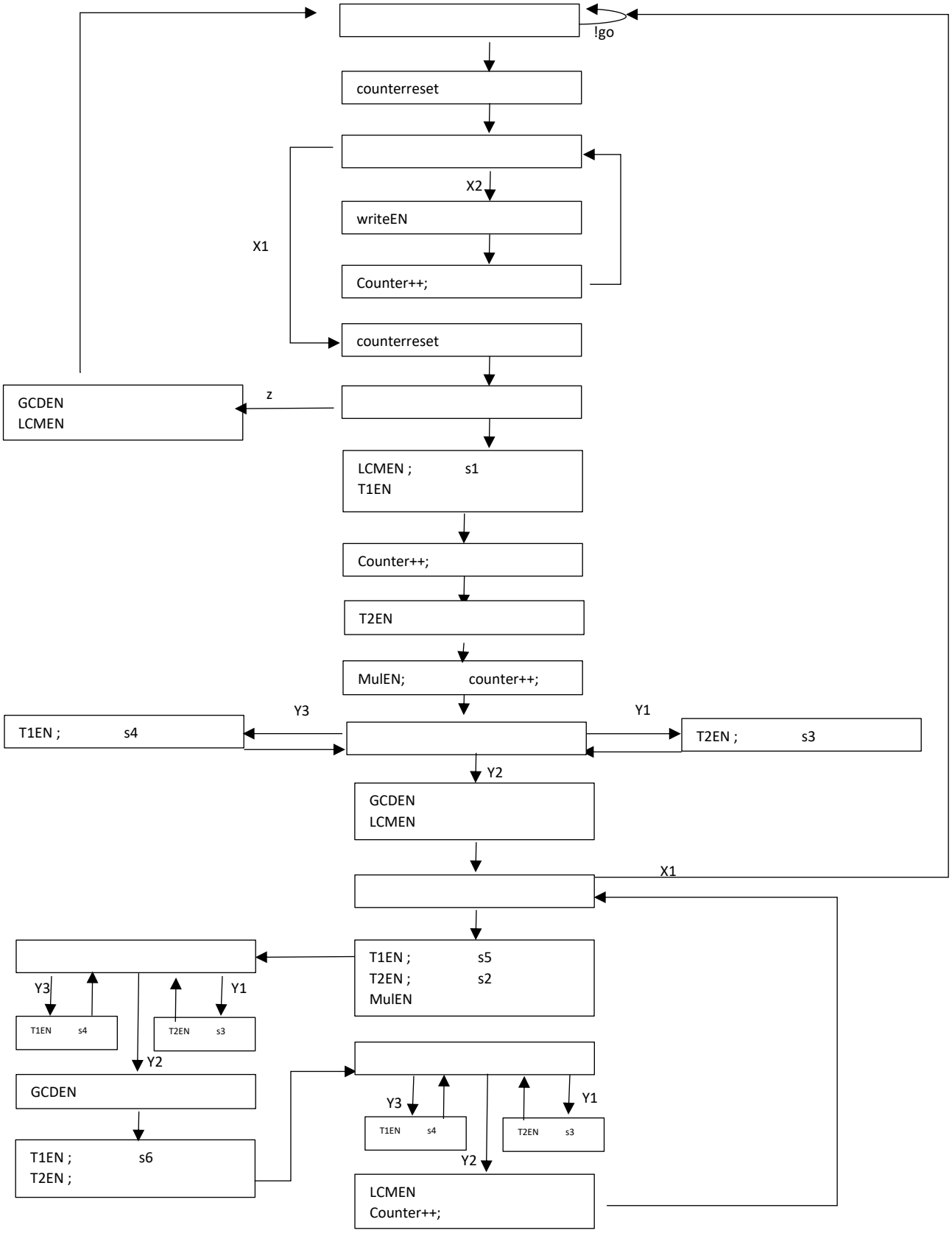
```c
int arr[255];
int n ;

int where_to_wite = 0 ;
int GCD , LCM;
int mul ;
int counter = 0 ;
int temp1 , temp2 ;
scanf("%d",&n);

while(counter < n){
    scanf("%d",&arr[counter]);
    counter++ ;
}
counter = 0 ;

if(n==1){
    GCD = arr[counter];
    LCM = arr[counter];
}
else{

    LCM = arr[counter];
    temp1 = arr[counter++] ;
    temp2 = arr[counter++] ;
    mul = temp1*temp2 ;
    while(temp1 != temp2){
        if(temp1 > temp2){
            temp1 -= temp2 ;
        }
        if(temp1 < temp2){
            temp2 -= temp1 ;
        }
    }
    GCD = temp1 ;
    LCM = mul / GCD;
```

```c
    while(counter < n){
        temp1 = GCD ;
        temp2 = arr[counter] ;
        mul   = arr[counter]*LCM ;

        while(temp1 != temp2){
            if(temp1 > temp2){
                temp1 -= temp2 ;
            }
            if(temp1 < temp2){
                temp2 -= temp1 ;
            }
        }
        GCD = temp1 ;   // gcd
        temp1  = arr[counter];
        temp2  = LCM ;
        while(temp1 != temp2){
            if(temp1 > temp2){
                temp1 -= temp2 ;
            }
            if(temp1 < temp2){
                temp2 -= temp1 ;
            }
        }

        LCM = mul/temp1;



        counter++;
    }
}
printf("GCD GCD %d\n",GCD );
printf("GCD LCM %d\n",LCM );
```

ASM / State Diagram



ASM / State Diagram



Truth table

P_state	Go	Y1	Y2	Y3	X1	X2	Z	N_state
00000	0	X	X	X	X	X	X	00000
00000	1	X	X	X	X	X	X	00001
00001	X	X	X	X	X	X	X	00010
00010	X	X	X	X	1	0	X	00101
00010	X	X	X	X	0	1	X	00011
00011	X	X	X	X	X	X	X	00100
00100	X	X	X	X	X	X	X	00010
00101	X	X	X	X	X	X	X	00110
00110	X	X	X	X	X	X	0	01000
00110	X	X	X	X	X	X	1	00111
00111	X	X	X	X	X	X	X	00000
01000	X	X	X	X	X	X	X	01001
01001	X	X	X	X	X	X	X	01010
01010	X	X	X	X	X	X	X	01011
01011	X	X	X	X	X	X	X	01100
01100	X	1	X	X	X	X	X	01101
01100	X	X	X	1	X	X	X	01110
01100	X	X	1	X	X	X	X	01111
01101	X	X	X	X	X	X	X	01100
01110	X	X	X	X	X	X	X	01100
01111	X	X	X	X	X	X	X	10000
10000	X	X	X	X	1	X	X	00000
10000	X	X	X	X	X	1	X	10001
10001	X	X	X	X	X	X	X	10010
10010	X	1	X	X	X	X	X	10011
10010	X	X	X	1	X	X	X	10100
10010	X	X	1	X	X	X	X	10101
10011	X	X	X	X	X	X	X	10010
10100	X	X	X	X	X	X	X	10010
10101	X	X	X	X	X	X	X	10110
10110	X	X	X	X	X	X	X	10111
10111	X	1	X	X	X	X	X	11000

10111	X	X	X	1	X	X	X	11001
10111	X	X	1	X	X	X	X	11010
11000	X	X	X	X	X	X	X	10111
11001	X	X	X	X	X	X	X	10111
11010	X	X	X	X	X	X	X	10000

N4 = p4.x1’ + p4’p3p2p1p0

N3 = p4’p3’p2p1p0’z’ + p4’p3p2’p1’p0’ + p4’p3p2’p1’p0 + p4’p3p2’p1p0’+
p4’p3p2’p1p0 + p4’p3p2p1’p0’ + p4’p3p2p1’p0 + p4’p3p2p1p0’ +
p4p3’p2p1p0

N2 = p4’p3’p2’p1p0’x1 + p4’p3’p2’p1p0 + p4’p3’p2p1’p0 + p4’p3’p2p1p0’z+
p4’p3p2’p1p0 + p4’p3p2p1’p0’ + p4’p3p2p1’p0 + p4’p3p2p1p0’ +
p4p3’p2’p1p0’ + p4p3’p2p1’p0 + p4p3’p2p1p0’ + p4p3p2’p1’p0’ +
p4p3p2’p1’p0

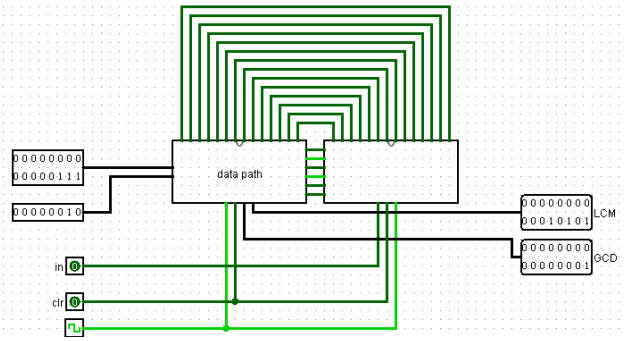
N1 = p4’p3’p2’p1’p0 + p4’p3’p2’p1p0’x2 + p4’p3’p2p1’p0’ + p4’p3’p2p1’p0+
p4’p3’p2p1p0’z + p4’p3p2’p1’p0 + p4’p3p2’p1p0’ + p4’p3p2p1’p0’(y_2+y_3) +
p4p3’p2’p1’p0 + p4p3’p2’p1p0’y1 + p4p3’p2’p1p0 + p4p3’p2p1’p0’ +
p4p3’p2p1’p0 + p4p3’p2p1p0’ + p4p3’p2p1p0y2 + p4p3p2’p1’p0’ +
p4p3p2’p1’p0

N0 = p4’p3’p2’p1’p0’in + p4’p3’p2’p1p0’ + p4’p3’p2p1p0’z + p4’p3p2’p1’p0’+
p4’p3p2’p1p0’ + p4’p3p2p1’p0’(y_1+y_2) + p4p3’p2’p1’p0’x2 +
p4p3’p2’p1p0’(y_1+y_2) + p4p3’p2p1p0’ + p4p3’p2p1p0y3 + p4p3p2’p1’p0’ +
p4p3p2’p1’p0

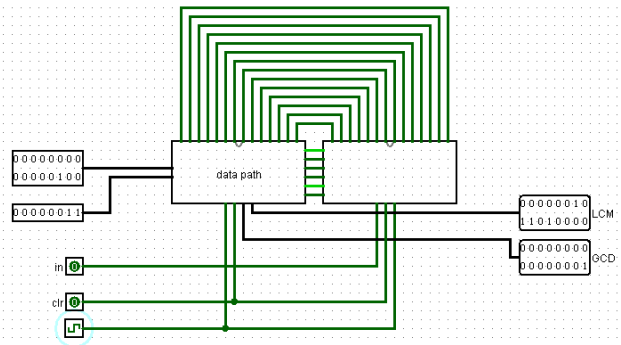
LCMEN = p4’p3’p2p1p0 + p4’p3p2’p1’p0’ + p4’p3p2p1p0 + p4p3p2’p1p0’
GCDEN = p4’p3’p2p1p0 + p4’p3p2p1p0 + p4p3’p2p1’p0
mulEN = p4’p3p2’p1p0 + p4p3’p2’p1’p0
s1 = p4’p3p2’p1’p0’
s2 = p4p3’p2’p1’p0
s3 = p4’p3p2p1’p0 + p4p3’p2’p1p0 + p4p3p2’p1’p0’
s4 = p4’p3p2p1p0’ + p4p3’p2p1’p0’ + p4p3p2’p1’p0
s5 = p4p3’p2’p1’p0
s6 = p4p3’p2p1p0’
t1EN = p4’p3p2’p1’p0’ + p4’p3p2p1p0’ + p4p3’p2’p1’p0 + p4p3’p2p1’p0’ +
p4p3’p2p1p0’ + p4p3p2’p1’p0
t2EN = p4’p3p2’p1p0’ + p4’p3p2p1’p0 + p4p3’p2’p1’p0 + p4p3’p2’p1p0 +
p4p3’p2p1p0’ + p4p3p2’p1’p0’
writeEN = p4’p3’p2’p1p0
counterreset = p4’p3’p2’p1’p0 + p4’p3’p2p1’p0
counter++ = p4’p3’p2p1’p0’ + p4’p3p2’p1’p0 + p4’p3p2’p1p0 + p4p3p2’p1p0’

results :

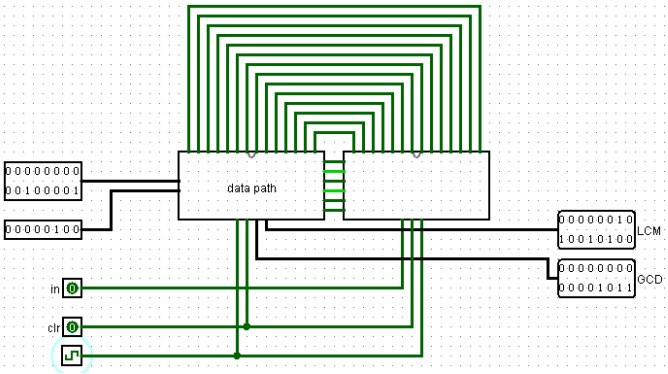
number = 3 , 7 , n = 2



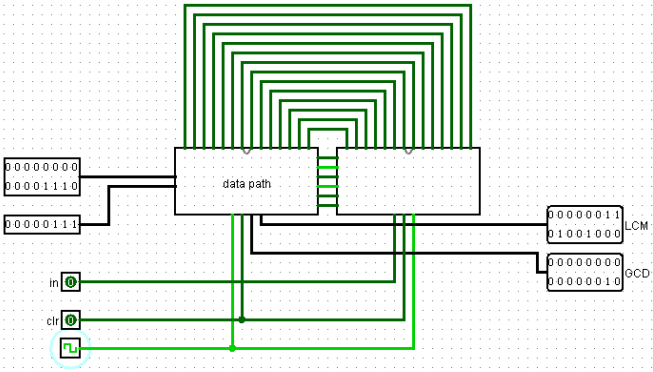
Number = 4 , 16 , 45 , n = 2 ;



Number = 55 , 44 , 33 , 11 ; n = 4



Number = 2 4 6 8 10 12 14 ; n = 7



Number = 5 ; n =1 ;