Длинная Арифметика

Code：

```c
#include <stdio.h>
#include <stdlib.h>

#define N 32//size of unsigned int array

unsigned char AAA[32];
unsigned char BBB[32];
unsigned char CCC[32];
unsigned char DDD[32];

//Initialization
void Init(unsigned char Tmp[N],long long n){
  int i=0;
  while(n/256){
    Tmp[i++]=n%256;
    n=n/256;
  }
  Tmp[i]=n;
}

//Print
void Print(unsigned char X[N]){
    for(int i=N-1;i>=0;i--)
      printf("%X ",X[i]);
}

//Addition
void Add(unsigned char C[N],unsigned char A[N],unsigned char B[N]){
    for(int i=0;i<N;i++){
        //if have number carrying
        if(A[i]+B[i]+C[i]>=256){
            C[i]+=A[i]+B[i]-256;
            C[i+1]+=1;
        }
        else C[i]+=A[i]+B[i];
    }
}

//Multiplication
void Multi(unsigned char C[N],unsigned char A[N],unsigned char B[N]){
    for(int i=0;i<N;i++){
        for(int j=0;j<N;j++){
            if(A[j]*B[i]+C[j+i]>=256){
                C[j+i]+=(A[j]*B[i])%256;
                C[j+i+1]+=(A[j]*B[i])/256;
            }
            else C[j+i]+=A[j]*B[i];
        }
    }
}

int main(){
    long long int m,n;
    printf("Input 1st number:\n");
    scanf("%lld",&m);
    printf("Input 2nd number:\n");
    scanf("%lld",&n);
    Init(AAA,m);
    Init(BBB,n);

    printf("New form of m:\n");
    Print(AAA);
    printf("\n");
    printf("New form of n:\n");
    Print(BBB);
    printf("\n");

    printf("The sum of m and n:\n");
    Add(CCC,AAA,BBB);
    Print(CCC);
    printf("\n");

    printf("The mutil of m and n:\n");
    Multi(DDD,AAA,BBB);
    Print(DDD);

    return 0;
}
```

Simple Example of realization:

```
Input 1st number:
255
Input 2nd number:
2
New form of m:
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 FF
New form of n:
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 2
The sum of m and n:
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1
The mutil of m and n:
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 FE
--------------------------------
```

Complex Example of realization:

```
Input 1st number:
19990822
Input 2nd number:
20000515
New form of m:
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 31 9 26
New form of n:
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 31 2F 3
The sum of m and n:
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 2 62 38 29
The mutil of m and n:
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 6B A2 E9 86 15 72
--------------------------------
```