

ASSIGNMENT-2

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Subject: CO

Question.) Take two decimal numbers and multiply them after converting to unsigned binary numbers.

Answer:

Header file:

```
int power(int a, int b)
{
    int ans=1;
    for(int i=0;i<b;i++)
    {
        ans*=a;
    }
    return ans;
}

// decimal to binary
Long Long int dtob(Long Long int decimal)
{
    Long Long int binary=0,x=1;
    while((x*2)<=decimal)
        x*=2;

    while(x>0)
    {
        Long Long int a=decimal/x;
        decimal-=a*x;
        x/=2;
        binary=binary*10+a;
    }
    return binary;
}

// binary to decimal
Long Long int btod(Long Long int binary)
{

```

```

    long long int decimal=0,x=1;
    while(x>0)
    {
        long long int a=binary%10;
        decimal+=x*a;
        x*=2;
        binary/=10;
    }
    return decimal;
}

// ass2
long long addition_unsigned_binary_numbers_U20CS028(long long binary1,long long binary2)
{
    long long int answer=0,i=0,remainder=0;
    while(binary1>0 || binary2>0)
    {
        long long int add=binary1%10 + binary2%10 + remainder;
        answer=answer+ (add%2)*power(10,i);
        remainder=add/2;
        i++;
        binary1/=10;
        binary2/=10;
    }
    if(remainder==1)
        return answer+power(10,i);

    return answer;
}

long long int multiplication_unsigned_binary_numbers_U20CS028(int decimal1,int decimal2)
{
    int sum=0;
    if(decimal1>=decimal2)
    {
        long long int bin1=dtob(decimal1);
        for(int i=0;i<decimal2;i++)
        {
            sum=addition_unsigned_binary_numbers_U20CS028(sum,bin1);
        }
    }
    else if(decimal1<decimal2)
    {
        long long int bin2=dtob(decimal2);
        for(int i=0;i<decimal1;i++)
        {

```

```

        sum=addition_unsigned_binary_numbers_U20CS028(sum,bin2);
    }
}
return sum;
}

```

C file:

```

#include <stdio.h>
#include <stdlib.h>
#include "coa2.h"

int main(int argc, char *d[])
{
    int decimal1 = atoi(d[1]);
    int decimal2= atoi(d[2]);

    Long Long int b=multiplication_unsigned_binary_numbers_U20CS028(decimal1,decimal2);
    int decimal=btod(b);
    printf("The multiplication of %d and %d in binary is %lld and indecimal is %d.\n",decimal1,decimal2,b,decimal);
}

```

Output:

```

PS F:\HEMANSHI M\C Program> gcc coa2.c
PS F:\HEMANSHI M\C Program> ./a.exe 12 3
The multiplication of 12 and 3 in binary is 100100 and indecimal is 36.
PS F:\HEMANSHI M\C Program> ./a.exe 3 4
The multiplication of 3 and 4 in binary is 1100 and indecimal is 12.
PS F:\HEMANSHI M\C Program> █

```