ASSIGNMENT-6

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

void add(int *s1 , int *s2)
{
    int carry = 0;
    for(int i=3 ; i>=0 ; i--)
    {
        s1[i] += (carry + s2[i]);
        if(s1[i]==2)
        {
            carry=1;
            s1[i]=0;
        }
        else if(s1[i]==3)
        {
            carry=1;
            s1[i]=1;
        }
        else
        {
            carry=0;
        }
    }
    carry=0;
}

void twoscom(int *n)
{
    int one[4] = {0,0,0,1};
    for(int i=0 ; i<4 ; i++)
    {
        if(n[i]==0)
        {
            n[i]=1;
        }
        else
```

```
        {
            n[i]=0;
        }
    }
    add(n,one);
}

void SHR(int *A , int *Q , int *q)
{
    q[0] = Q[3];
    for(int i=3 ; i>=1 ; i--)
    {
        Q[i] = Q[i-1];
    }
    Q[0] = A[3];
    for(int i=3 ; i>=1 ; i--)
    {
        A[i] = A[i-1];
    }
}

int decimal(int *n)
{
    int num=0, p=0;
    for(int k=3 ; k>=0 ; k--)
    {
        num += n[k]*pow(2,p);
        p++;
    }
    return num;
}

int decPROD(int *Q , int *M)
{
    int prod, sign=1;

    if(Q[0]==1)
    {
        twoscom(Q);
        sign *= (-1);
    }
    if(M[0]==1)
    {
        twoscom(M);
        sign *= (-1);
    }

    prod = sign*(decimal(Q)*decimal(M));
    return prod;
}

void main()
```

```
{
    int SC=4;
    int Q[4], Q1[4], M[4], M1[4];
    int n1, n2;

    printf("ENTER MULTIPLICAND : ");
    scanf("%d" ,&n1);
    printf("ENTER MULTIPLIER : ");
    scanf("%d" ,&n2);

    for(int i=3 ; i>=0 ; i--)
    {
        M[i] = M1[i] = (n1%10);
        Q[i] = Q1[i] = (n2%10);
        n1 = n1/10;
        n2 = n2/10;
    }

    twoscom(M1);

    int A[4] = {0,0,0,0};
    int q[1] = {0};

    while(SC!=0)
    {
        if(Q[3]==q[0])
        {
            SHR(A,Q,q);
            SC--;
        }
        else if(Q[3]==0 && q[0]==1)
        {
            add(A,M);
            SHR(A,Q,q);
            SC--;
        }
        else
        {
            add(A,M1);
            SHR(A,Q,q);
            SC--;
        }
    }

    printf("\n*****RESULT*****\n");
    printf("BINARY : ");
    for(int i=0 ; i<4 ; i++)
    {
        printf("%d" ,A[i]);
    }
    for(int i=0 ; i<4 ; i++)
    {
```

```
        printf("%d" ,Q[i]);
    }

    int prod = decPROD(Q1,M);
    printf("\nDECIMAL : %d\n",prod);
}
```

Output:

```
PS F:\HEMANSHI M\C Program> GCC code.c
PS F:\HEMANSHI M\C Program> ./a.exe


ENTER MULTIPLICAND : 10

ENTER MULTIPLIER : 100

*****RESULT*****
BINARY : 00001000
DECIMAL : 8
PS F:\HEMANSHI M\C Program>
```