Computer Organization

(Assignment-3)

- U20CS110
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- B110

Q1.

```c
//main.c

#include <stdio.h>
#include "1.h"

int main()
{
    int n1, n2, d, e;
    int b1, b2, multiply = 0;
    printf("Enter 2 numbers: ");
    scanf("%d %d", &n1, &n2);
    b1 = decimal_to_unsigned_binary_U20CS110(n1);
    b2 = decimal_to_unsigned_binary_U20CS110(n2);
    printf("Its binary number are: %d and %d \n", b1, b2);

    int digit, factor = 1;

    d = m(b1, b2);
    printf("Product result in binary numbers is: %d \n", d);
    e = bin_to_dec(d);
    printf("Product of two binary numbers in decimal is: %d \n", e);
}
```

Header file (1.h)

```c
//1.h

int decimal_to_unsigned_binary_U20CS110(int d)
{
    int mul = 1, res = 0;
    while (d)
    {
        res += mul * (d % 2);
```

```
        mul *= 10;
        d /= 2;
    }
    return res;
}

int multiplication_unsigned_binary_numbers_U20CS110(int b1, int b2)
{
    int i = 0, remainder = 0, sum[20];
    int binaryprod = 0;

    while (b1 != 0 || b2 != 0)
    {
        sum[i++] = (b1 % 10 + b2 % 10 + remainder) % 2;
        remainder = (b1 % 10 + b2 % 10 + remainder) / 2;
        b1 = b1 / 10;
        b2 = b2 / 10;
    }
    if (remainder != 0)
        sum[i++] = remainder;
    --i;
    while (i >= 0)
        binaryprod = binaryprod * 10 + sum[i--];
    return binaryprod;
}

int bin_to_dec(int binary1)
{
    int decimal = 0, base = 1, rem, num;

    num = binary1;
    while (binary1 != 0)
    {
        rem = binary1 % 10;
        decimal = decimal + rem * base;
        binary1 = binary1 / 10;
        base = base * 2;
    }
    return decimal;
}

int m(int b1, int b2)
{
    int multiply = 0;
    int digit, factor = 1;
    while (b2 != 0)
    {
        digit = b2 % 10;
```

```
        if (digit == 1)
        {
            b1 = b1 * factor;
            multiply = multiplication_unsigned_binary_numbers_U20CS110(b1, mul
tiply);
        }
        else
            b1 = b1 * factor;
        b2 = b2 / 10;
        factor = 10;
    }
    return multiply;
}
```

Output screenshot

```
PS C:\Krishna> cd "c:\Krishna\c\CO\assign3\" ; if ($?) { gcc main.c -o main } ; if ($?) { .\main }
Enter 2 numbers: 4 5
Its binary number are: 100 and 101
Product result in binary numbers is: 10100
Product of two binary numbers in decimal is: 20
PS C:\Krishna\c\CO\assign3> cd "c:\Krishna\c\CO\assign3\" ; if ($?) { gcc main.c -o main } ; if ($?) { .\main }
Enter 2 numbers: 12 20
Its binary number are: 1100 and 10100
Product result in binary numbers is: 11110000
Product of two binary numbers in decimal is: 240
PS C:\Krishna\c\CO\assign3>
```