

# **University of Dhaka**

Department of Computer Science and Engineering

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## **CSE 3113: Microprocessor and Assembly Lab**

Report of Tasks from Lab 8

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### **Submitted By**

Muhaiminul Islam Ninad

Roll: 43

### **Submitted To:**

Dr. Upama Kabir

Professor, Dept. of CSE, University of Dhaka

Dr. Mosarrat Jahan

Associate Professor, Dept. of CSE, University of Dhaka

Mr. Jargis Ahmed,

Lecturer, Dept. of CSE, University of Dhaka

Mr. Palash Roy,

Lecturer, Dept. of CSE, University of Dhaka

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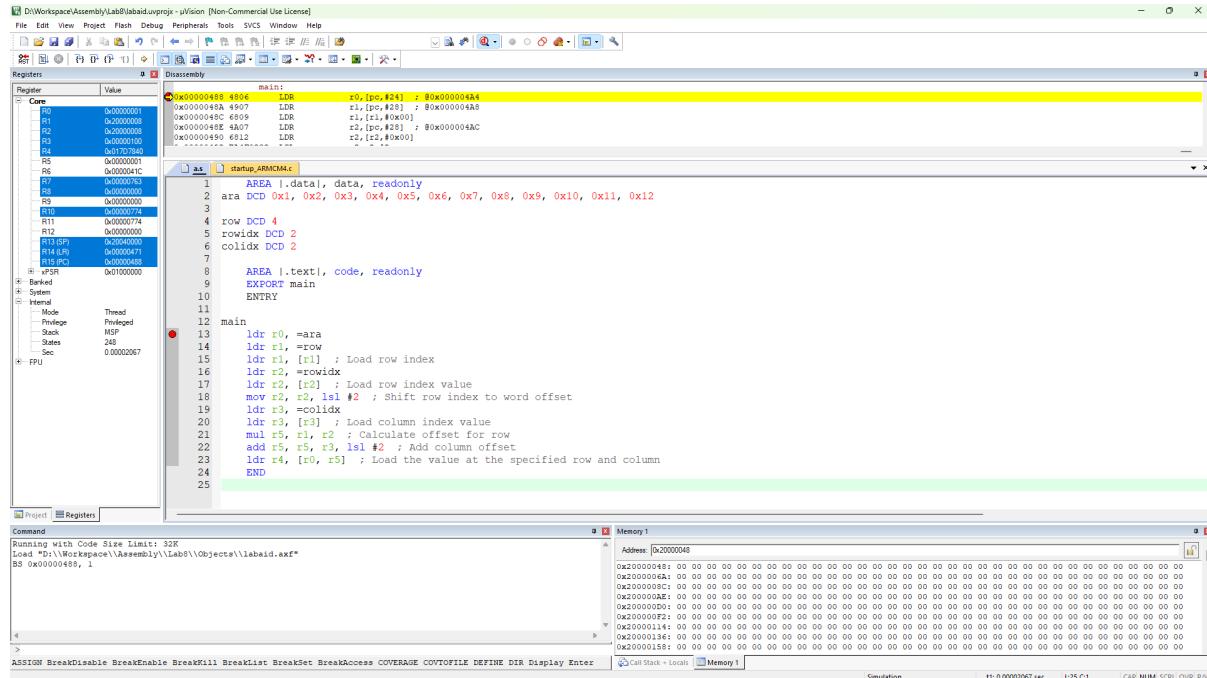
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# 1 Problem 1

Write an assembly language to create a 2D Array. Also use the 2D Array translation formula to access the Array elements making use of register indirect addressing mode.

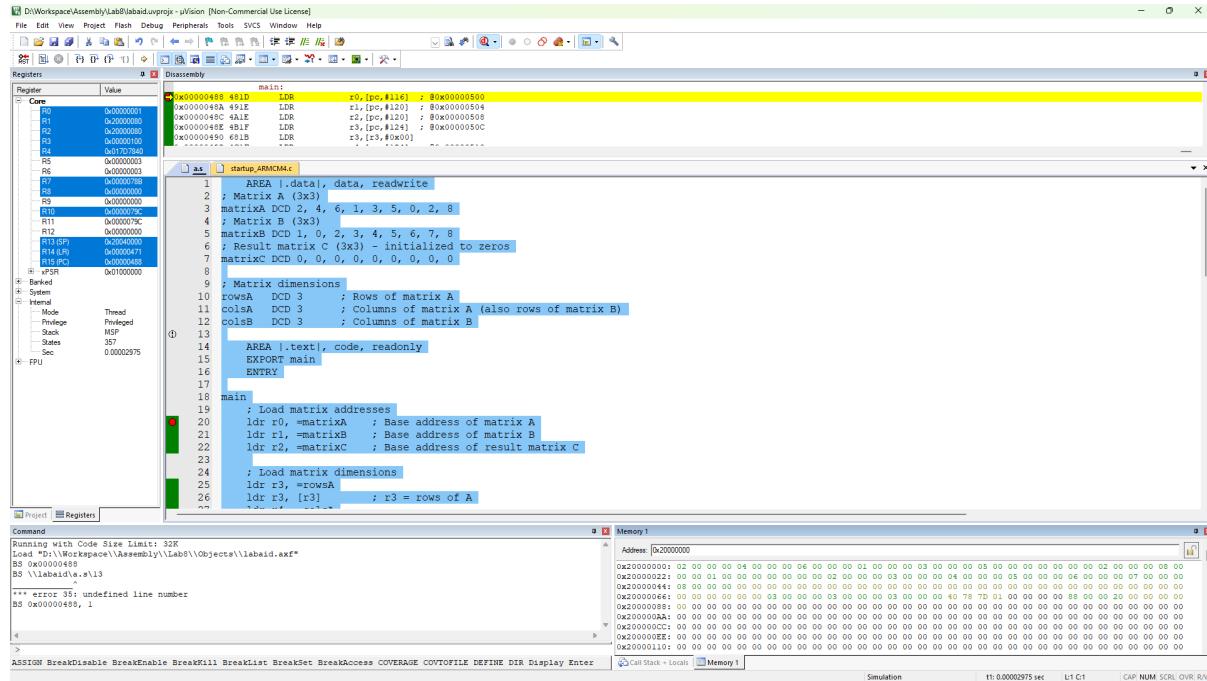
## 1.1 Screenshot at the start of execution



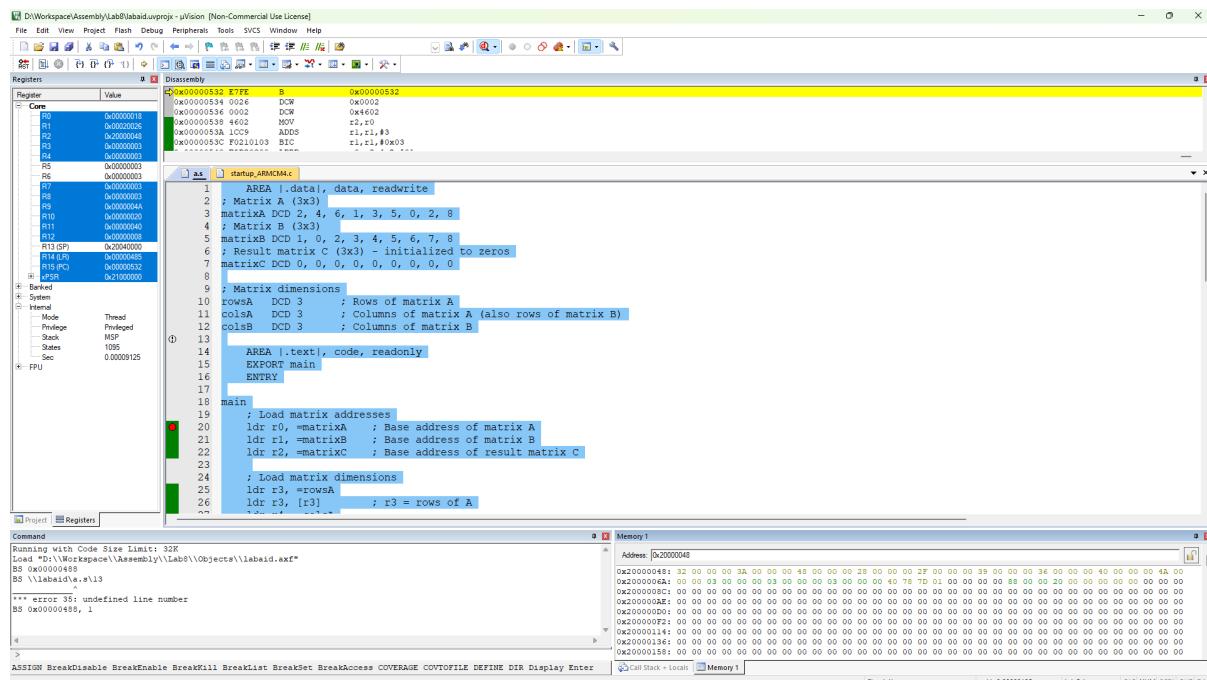
## 2 Problem 2

Write an assembly language to perform the multiplication of two matrices.

## 2.1 Screenshot at the start of execution



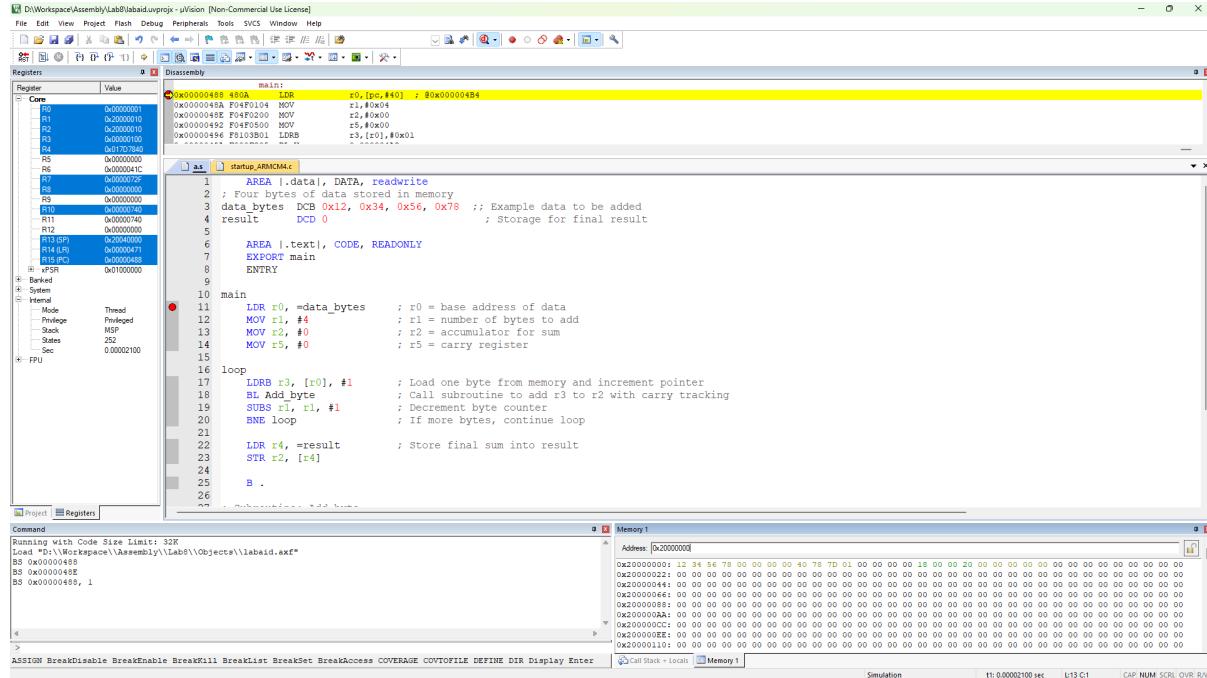
## 2.2 Screenshot at the end of execution



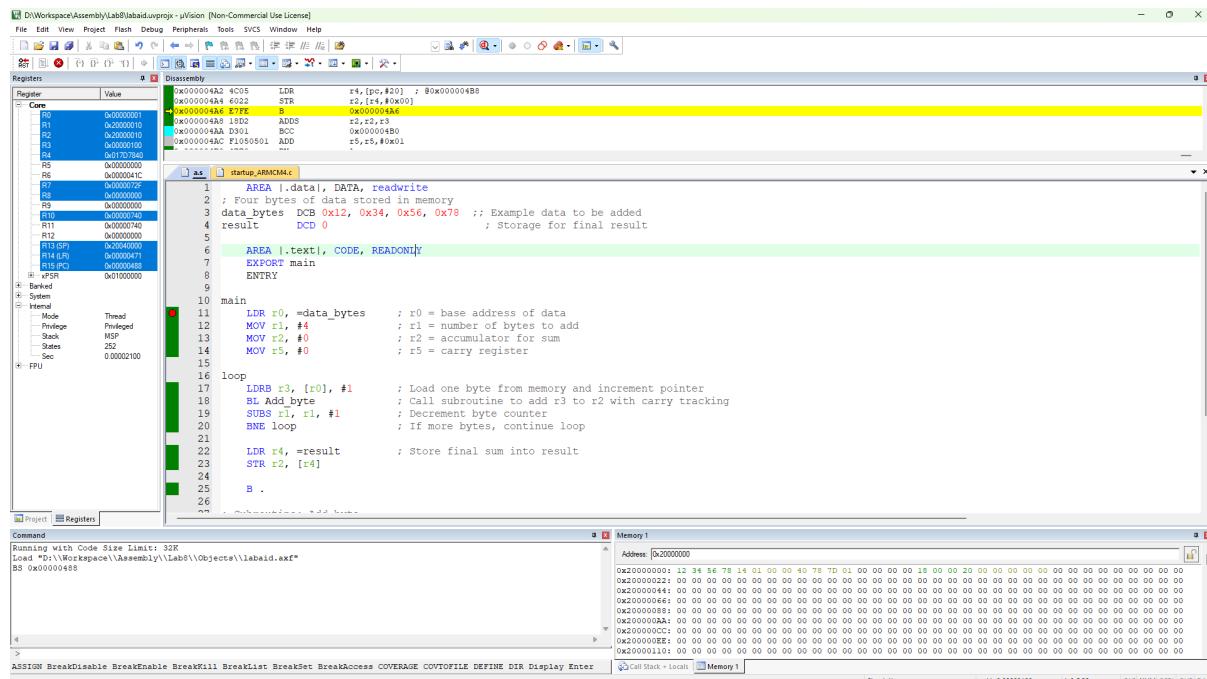
### 3 Problem 3

Write an assembly language in which four bytes of data are stored in memory location. Add all data bytes and use register r5 to store any carry generated while adding data bytes by calling a function Add\_byte

### 3.1 Screenshot at the start of execution



### 3.2 Screenshot at the end of execution



## 4 Problem 4

Write an assembly language which convert BCD data to Binary data by calling a function BCD\_binary.

### 4.1 Screenshot at the start of execution

```

main:
    LDR r0,[pc, #8] ; 0x00000480
    LDR r1,[r0, #0x000]
    LDR r2,[r0, #0x4]
    LDR r3,[r0, #0x8]
    STR r0,[r3, #0x000]
    .....
    AREA .data!, DATA, readonly
    bcd_value DCB 0x57
    binary_out DCD 0
    AREA .text!, CODE, READONLY
    EXPORT main
    ENTRY
    LDR r0, =bcd_value
    LDRB r1, [r0]
    BL BCD_binary
    LDR r3, =binary_out
    STR r2, [r3]
    .....
    B .
    BCD_binary
    AND r3, r1, #0xF0
    MOV r3, r3, LSR #4
    MOV r5, #10
    MUL r3, r3, r5
    AND r4, r1, #0x0F
    ADD r2, r3, r4
    ...

```

### 4.2 Screenshot at the end of execution

```

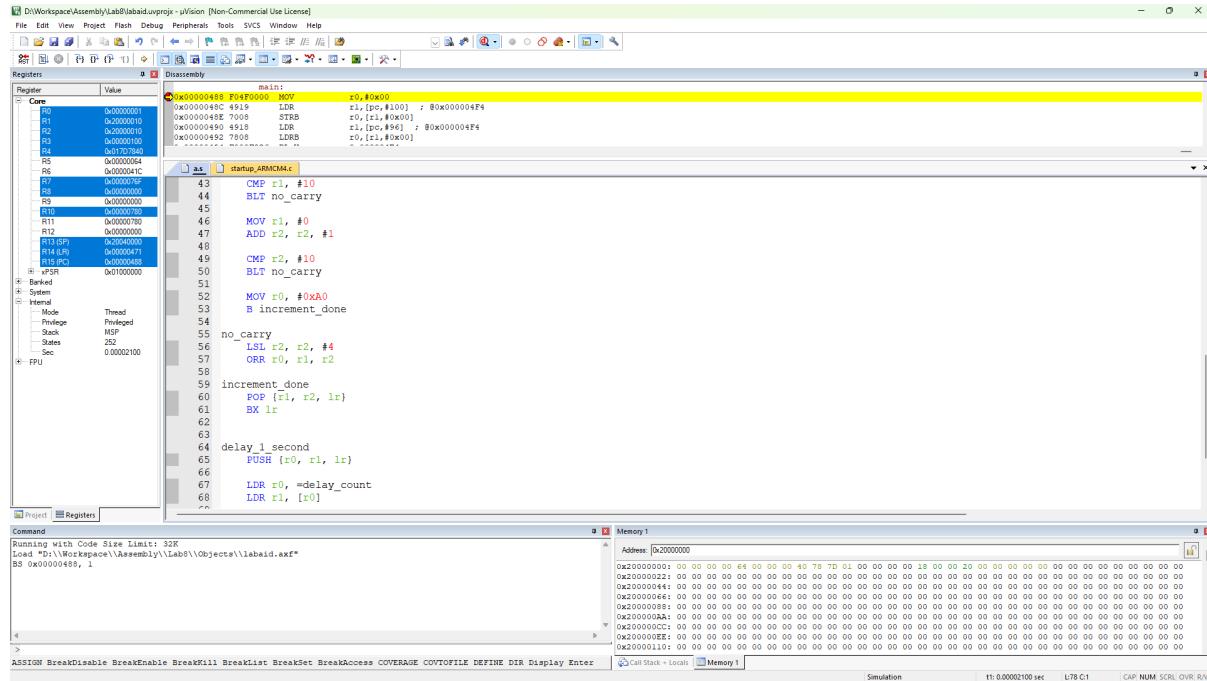
main:
    LDR r0,[pc, #8] ; 0x00000480
    LDR r1,[r0, #0x000]
    LDR r2,[r0, #0x4]
    LDR r3,[r0, #0x8]
    STR r0,[r3, #0x000]
    .....
    AREA .data!, DATA, readonly
    bcd_value DCB 0x57
    binary_out DCD 0
    AREA .text!, CODE, READONLY
    EXPORT main
    ENTRY
    LDR r0, =bcd_value
    LDRB r1, [r0]
    BL BCD_binary
    LDR r3, =binary_out
    STR r2, [r3]
    .....
    B .
    BCD_binary
    AND r3, r1, #0xF0
    MOV r3, r3, LSR #4
    MOV r5, #10
    MUL r3, r3, r5
    AND r4, r1, #0x0F
    ADD r2, r3, r4
    ...

```

## 5 Problem 5

Write an assembly language to implement a counter to count from '00 – 99' (UP-COUNTER) in BCD and also to generate a delay of one second between the counts.

## 5.1 Screenshot at the start of execution



## 5.2 Screenshot at the end of execution

