



Lab Exercise

Q1. Assume A is a label for 4x4 matrix and Z, and X are labels for arrays with 4 items (each item is 4 bytes) in the program. Write arm assembly for the following snippet code.

```
for (int row = 0; row < 4; row++)  
    for (int column = 0; column < 4; column++)  
        Z[row] += A [row, column] * X[column]
```

Q2. Design and write an ARM Assembly Language subroutine that calculates the value of xx^{yy} . The initialization part of the assembly code is given as below.

```
MOV R0,#7 ; R0 is xx  
  
MOV R1,#3 ; R1 is yy
```

In your code, pass the parameters through registers. Explain the usage of the registers in this problem.



Lab Submission

Q3. Write ARM assembly code to sum the array items of size 10 and store it in the memory. The array contains the following values: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10.

Q4. Design and write an ARM Assembly Language subroutine that retrieves the minimum and maximum numbers between 6 given numbers. The initialization part of the assembly code is given as below.

```
MOV R0,#6 ; R0 elem count  
  
MOV R1,#-14 ; from R1 to R6 are the elements that we should calculate the minimum and maximum  
among them  
  
MOV R2,#5  
  
MOV R3,#32  
  
MOV R4,#-7  
  
MOV R5,#0  
  
MOV R6,#-5
```

In your code, use a mixture between passing parameters through registers and through the stack. Explain the usage of the stack in this problem.