

CSCI 2510 Computer Organization 2018-19

Assignment 2

Deadline

Questions 1 & 2: October 23, 2018 (TUE) 14:30pm

Programming Exercise: October 30, 2018 (TUE) 14:30pm

Submission Notes:

- (1) For each of the following written exercises (*for Question 1-2*), please show your steps, and explain in detail when needed to receive full credit.
- (2) Submit two files named **CSCI2510_Assignment2.pdf** (*for Question 1-2*) and **stack.asm** (*for Programming Exercise*) to Blackboard Assignment Collection Box before the deadline.
- (3) Late submission per day is subject to 10% of penalty.

Question 1 (20 pts)

List the common flags in Condition Code Register, and describe the situation when they are set to 1 and give an example for each flag.

Question 2 (20 pts)

Determine the effective address (EA) of the last operand, given R1 = 1024, R2 = 512, R3 = 256, and the memory location LOC = 1024

- (a) ADD R1, R2, R3
- (b) LOAD R1, (R3)
- (c) LOAD R1, (R2, R3)
- (d) LOAD R1, LOC
- (e) LOAD R1, -128(R1)

Programming Exercise (60 pts)

According to the comment hint in the program, complete a MASM IA-32 assembly program named **stack.asm** to implement a stack. You should write **one line** code in the line marked with “fill in”. There are 10 places marked with “fill in”. (Please see reference in Tutorial 4 and queue.asm).

a) Test the program using sequence 1 2 3 4 5 0 0 0 0 0, and the result should be like:

```
Enter Number or command(0: pop, other number: number to be pushed in the stack) : 1
Enter Number or command(0: pop, other number: number to be pushed in the stack) : 2
Enter Number or command(0: pop, other number: number to be pushed in the stack) : 3
Enter Number or command(0: pop, other number: number to be pushed in the stack) : 4
Enter Number or command(0: pop, other number: number to be pushed in the stack) : 5
Enter Number or command(0: pop, other number: number to be pushed in the stack) : 0
pop 5
Enter Number or command(0: pop, other number: number to be pushed in the stack) : 0
pop 4
Enter Number or command(0: pop, other number: number to be pushed in the stack) : 0
pop 3
Enter Number or command(0: pop, other number: number to be pushed in the stack) : 0
pop 2
Enter Number or command(0: pop, other number: number to be pushed in the stack) : 0
pop 1
Enter Number or command(0: pop, other number: number to be pushed in the stack) : 0
ERROR THE STACK IS EMPTY
```

b) Test the program using sequence 1 2 3 4 5 6 7 8 9 10 11, and the result should be like:

```
Enter Number or command(0: pop, other number: number to be pushed in the stack) : 1
Enter Number or command(0: pop, other number: number to be pushed in the stack) : 2
Enter Number or command(0: pop, other number: number to be pushed in the stack) : 3
Enter Number or command(0: pop, other number: number to be pushed in the stack) : 4
Enter Number or command(0: pop, other number: number to be pushed in the stack) : 5
Enter Number or command(0: pop, other number: number to be pushed in the stack) : 6
Enter Number or command(0: pop, other number: number to be pushed in the stack) : 7
Enter Number or command(0: pop, other number: number to be pushed in the stack) : 8
Enter Number or command(0: pop, other number: number to be pushed in the stack) : 9
Enter Number or command(0: pop, other number: number to be pushed in the stack) : 10
Enter Number or command(0: pop, other number: number to be pushed in the stack) : 11
ERROR THE STACK IS FULL
请按任意键继续
```

c) Test the program using sequence 1 0 1 2 0 0 3 4 0 0 0, and the result should be like:

```
Enter Number or command(0: pop, other number: number to be pushed in the stack) : 1
Enter Number or command(0: pop, other number: number to be pushed in the stack) : 0
pop 1
Enter Number or command(0: pop, other number: number to be pushed in the stack) : 1
Enter Number or command(0: pop, other number: number to be pushed in the stack) : 2
Enter Number or command(0: pop, other number: number to be pushed in the stack) : 0
pop 2
Enter Number or command(0: pop, other number: number to be pushed in the stack) : 0
pop 1
Enter Number or command(0: pop, other number: number to be pushed in the stack) : 3
Enter Number or command(0: pop, other number: number to be pushed in the stack) : 4
Enter Number or command(0: pop, other number: number to be pushed in the stack) : 0
pop 4
Enter Number or command(0: pop, other number: number to be pushed in the stack) : 0
pop 3
Enter Number or command(0: pop, other number: number to be pushed in the stack) : 0
ERROR THE STACK IS EMPTY
```