EECE.3170: Microprocessor Systems Design I

Summer 2017

Lecture 3: Key Questions
May 18, 2017

1. Describe the x86 flags.

2. Describe the operation of the ADD, ADC, and INC instructions.

3. Describe the operation of the SUB, SBB, DEC, and NEG instructions.

4. Given the following initial state:
   - AX = 1234h
   - BL = ABh
   - Memory location SUM = 00CDh

Show the results of each step of the following instruction sequence. Be sure to track the carry flag throughout the sequence:

```
ADD AX, [SUM]
ADC BL, 05h
NEG BL
SUB AX, 12h
INC WORD PTR [SUM]
```

5. Describe the operation of the MUL and IMUL operations.

6. Describe the operation of the DIV and IDIV operations.

7. **Example:** Given EAX = 00000005h and EBX = 0000FF02h, what are the results of the following instructions? Assume each instruction starts with the values shown above in EAX and EBX.

a. MUL BL

b. MUL BH

c. IMUL BH

d. DIV BL

e. DIV BH

f. IDIV BH