CS271 WK4 BOOK

6.1, 6.2, 6.3, 7.3, 12.1

6.1-6.3

Bitwise Operations
- AND, OR, XOR, NOT, TEST
- TEST is an implied bool AND operation between the source and the destination, that sets the CPU flags

7.3

Multiplication
- MUL can multiply an 8-bit operand by AL, a 16-bit operand by AX or a 32-bit operand by EAX
- MUL outputs:

AL → Result in AX
AX → Result in DX:AX
EAX → Result in EDX:EAX

} Check CF to see if upper half used.

- IMUL does signed multiplication, sign Xtending its result.
  - ↳ sets the CF to indicate "top" lower end used
  - ↳ sets OF if "low" is not sx for result.
    - ↳ i.e. 48.4 into AX: 00(AL):C0h(AH) OF=1 as AL is not sx for result.

Division
- Just like multiplication, Q and R are "divided" into different registers

AX → AL(Q) : AH(R)
DX:AX → AX : DX
EDX:EAX → EAX : EDX

zero before DIV if not in use!!

- CBW, CDQ, CWD sign extend:
  AL → AL EAX → EDX AX → DX

QUICK DIVISION NOTE: when dividing do this to avoid overflow

```
MOV eax 0x1000
CDQ
MOV ebx 0x10
DIV ebx          ; EAX = 0000.0100h
Back to notes!
```

- IDIV does signed DIVISION

12.1

: see lecture Notes ☺.