

CS 286-001 Computer Architecture & Organization
Fall 2026

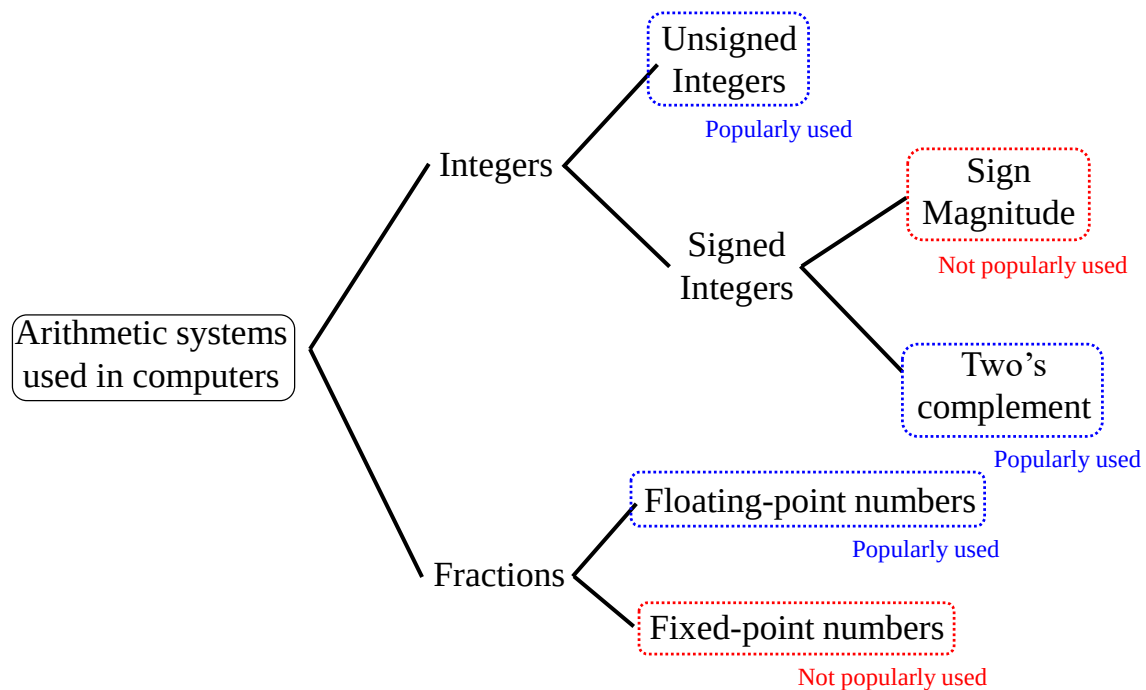
Quiz #5 on September 30, 2026 (**SOLUTIONS**)

Your Last Three Digits: _____

(please do NOT write all of your student ID or your name)

Grade: _____

(1) Complete the following figure by specifying number systems we discussed in the classroom.



(2) What is “Overflow Flag” in a processor (how is it used) for handling operations on two’s complement integers?

Overflow flag is a one-bit (in the special register) that is raised when a mathematical operation exceeds the largest positive integer or goes under the smallest negative integer.

- (3) What is “Carry Flag” in a processor (how is it used) for handling operations on two’s complement integers?

Carry flag is a one-bit (in the special register) that is raised when a mathematical operation generates one extra bit.

- (4) Show the binary bit pattern for “-3” in 8-bit two’s complement integer.

0: 0000 0000

-1: 1111 1111

-2: 1111 1110

-3: 1111 1101

- (5) Assuming 8-bit two’s complement integers, will the following calculation cause:

(a) The overflow flag. If yes, show how. If no, show how not.

(b) The carry flag. If yes, show how. If no, show how not.

Note: show all your work for full credit.

$$\begin{array}{r} 102: 0110\ 1000 \\ + \quad 89: 0101\ 1001 \\ \hline \end{array}$$

$$\begin{array}{r} 102: 0110\ 1000 \\ + \quad 89: 0101\ 1001 \\ \hline 1100\ 0001: -63 \end{array}$$

no extra binary digit generated

if the result of adding two positive integers is minus, the second boundary must have been gone across

Carry Flag: 0

Overflow Flag: 1