# CS 160
# CS Orientation

Number Conversions/Algorithms

# Digital Realm

- Based on discrete #s
  - Specifically: Circuits
- Binary, i.e. base 2
  - 0 or 1
- What base do most people use?
  - What is the range for each digit?
- What is Hexadecimal?, i.e. base 16
  - What is the range for each digit?

# Decimal, Binary, & Hex

- Decimal
  - Powers of 10
- Binary
  - Powers of 2
- Base X to Base 10 conversion
  - 32 (base 10): $3*10^1 + 2*10^0 = 32$ (base 10)
  - 100000 (base 2): $1*2^5 + 0*2^4 + 0*2^3 + 0*2^2 + 0*2^1 + 0*2^0 = 32$ (base 10)
  - How do we express 35 (base 10) in base 2 vs. base 16?

# 8 volunteers:
# As a class use volunteers to…

- Convert 11110010 (base 2) to base 10.

- Convert 227 (base 10) to base 2.

# More Binary

- What is each digit called?
- What is a Byte?
- How many numbers can be expressed in a Byte?
  - Signed/Unsigned
- What is the smallest number?
- What is the largest number?
- Help:

http://classes.engr.oregonstate.edu/eecs/fall2015/cs160-001/Exam1Review1.txt

# Get into groups 4-5

- What is the smallest/largest unsigned number in 16 bits?
- What is the smallest/largest signed number in 16 bits?
- What is the smallest/largest unsigned number in x bits?