CS21

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Questions:

What does each individual digit tell use?

* How many times to include the place value when calculating magnitude of the number

**Binary – Base 2**

| { 0 , 1} | = 2

Terms:

Brackets: [ ] , <>

Braces: { }, ( )

Ex.

10112 = 1110

8 4 2 1

1 0 1 1

8 + 2 + 1 = 11

**Bit vs Byte**

Bit (short for binary digit):

* A 0 or 1
* Storage inside a computer that holds 0 or 1

Byte:

* A group of 8 bits

Word (in English concept): abstraction of a concept

Word (in computer science logic): 1 byte or 8 bits

Word (modern computer science logic): 4 bytes

**Signed Numbers**

Sign magnitude to represent negative numbers

Ex. ± digits, +135, -643, 187 (assumed to be positive)

In order to represent a sign in binary you must reserve 1 bit (usually rightmost digit)

0 – positive

1 – negative

Ex.

0000 0000 🡪 0

1000 0000 🡪 -0

**One’s Complement**

0000 1011 = 11

1111 0100 = -11

0000 0000 = 0

1111 1111 = -0