

# Math 451

---

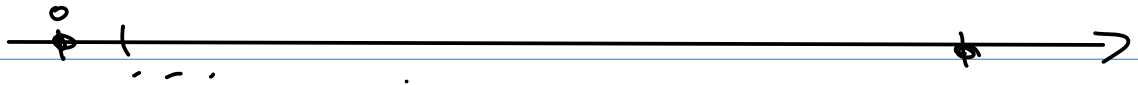
Objects: (numbers) 8 bit, 16 bit, ..., 64 bit

64 bit

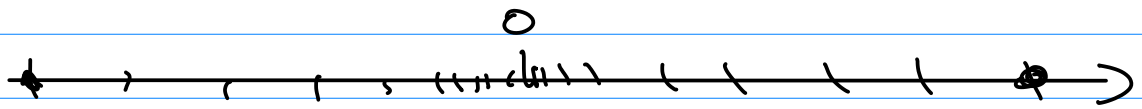
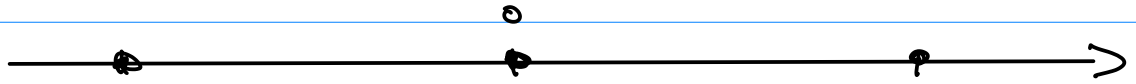
$2^{64}$  number of bit strings to work with.  
 $\approx 1.6 \times 10^{19} \approx 2 \times 10^{18}$

2,000,000,000,000,000,000

uint



int



$$\left( \begin{matrix} + \\ - \end{matrix} \right) \boxed{\text{sig. dig.}} \times 10^{\boxed{\text{Pow}}}$$

eps → how close the floats are

---

## Matrices / Arrays

$$A = \begin{bmatrix} a_{11} & a_{12} & \dots & a_{1n} \\ \vdots & & & \\ a_{m1} & a_{m2} & & a_{mn} \end{bmatrix}$$

$m \times n$

Ops

$+$ ,  $*$ ,  $-$ ,  $\wedge$ ,  $/$ ,  $\setminus$ ,  $\cdot^*$ ,  $\cdot /$ ,  $\cdot \setminus$ ,  $\cdot \wedge$

Functions: log, sin, etc

$$\frac{1}{2} \quad 1/2$$

$$\textcircled{A} B = C$$

$$\textcircled{A^{-1} A} B = A^{-1} C$$

$$\alpha \begin{cases} B = A^{-1} C \\ B = A \setminus C \end{cases}$$

$$A^T A x = A^T b$$

$$x = \textcircled{A} \setminus b$$

$$x = (A^T A)^{-1} (A^T b)$$

$$\frac{1}{2} \cdot 2 x = \textcircled{\frac{1}{2}} \cdot 1$$

$$\textcircled{2x} \quad \boxed{A B = C} \quad x =$$

$$A = C \cdot B^{-1}$$

$$A = C / B \rightarrow C B^{-1}$$

$$C \setminus B \rightarrow C^{-1} B$$

---

$\sin(x)$   $\rightarrow$  typically away

---

Flow Control

For (loop)

if (conditional)

for  $i =$  array  
end

$F$  (logical)

do

else

do

end