

Lecture 34: Factorial

$$n! = n \cdot (n-1) \cdot (n-2) \cdot (n-3) \cdot \dots \cdot 1$$

n needs to be positive int ≥ 1 .

Define $0! = 1$

$$4! = 4 \cdot 3 \cdot 2 \cdot 1 = 24$$

$$3! = 3 \cdot 2 \cdot 1 = 6 \quad \begin{array}{l} \text{4. factorial(3)} \\ \text{3!} \end{array}$$

factorial(4)

$$4! = 4 \cdot 3 \cdot 2 \cdot 1 = 4 \cdot (3 \cdot 2 \cdot 1)$$

factorial(3)

$$3! = 3 \cdot 2 \cdot 1 = 3 \cdot (2 \cdot 1) \quad \left. \begin{array}{l} \text{2!} \\ \text{3. factorial(2)} \end{array} \right\}$$

factorial(2)

$$2! = 2 \cdot 1 = 2 \cdot (1) \quad \left. \begin{array}{l} \text{1!} \\ \text{2. factorial(1)} \end{array} \right\}$$

$$1! = 1 \cdot 1 = 1 \cdot (1) \quad \left. \begin{array}{l} \text{0!} \\ \text{1. factorial(0)} \end{array} \right\}$$

factorial(1)

$0!$ defined as 1 "base case"
problem boils down to
a fixed number: 1