# Hello, World!

## A Presentation about Things

Alice Example
(she/her)
alice@example.com

Bob Example
(he/him)
bob@example.com

University of Example

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# A Paragraph of Lipsum

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# Dolor Sit

**Consectetur adipiscing**:

- eiusmod
- tempor
- incididunt

**Adipiscing pariatur**:

1. eiusmod
2. tempor
3. incididunt

# A Proof

## Oh yeah

### Theorem

$$\sum_{i=1}^{n} i = \frac{n(n+1)}{2}, \quad \forall n \in \mathbb{N}.$$

### Proof.

Basis:

$$\sum_{i=1}^{1} i = 1 = \frac{1(1+1)}{2}.$$

...

## Proof.

Suppose the statement holds for an $n \in \mathbb{N}$.
Induction: We'll show that, as $n \longrightarrow n+1$:

$$\sum_{i=1}^{n+1} i = \frac{(n+1)(n+2)}{2} = \frac{n^2+3n+2}{2}.$$

Per the induction hypothesis, (1) holds, and thus:

$$\begin{aligned}\sum_{i=1}^{n+1} i &= \sum_{i=1}^{n} i + (n+1) \overset{(1)}{=} \frac{n(n+1)}{2} + (n+1) \\ &= \frac{n(n+1)}{2} + \frac{2(n+1)}{2} = \frac{n^2+3n+2}{2}.\end{aligned}$$

□

# Task: Prove $\sum_{i=1}^{n} i^2 = \frac{n(n+1)(2n+1)}{6}, \ \forall n \in \mathbb{N}.$