

## 2.2.2

An example of a non-regular language

# A non-regular language and other closure properties

Consider  $L = \{0^n 1^n \mid n \geq 0\} = \{\epsilon, 01, 0011, 000111, \dots\}$ .

## Theorem

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*The language  $L$  is **not** a regular language.*

How do we prove it?

Other questions:

- Suppose  $R_1$  is regular and  $R_2$  is regular. Is  $R_1 \cap R_2$  regular?
- Suppose  $R_1$  is regular is  $\overline{R_1}$  (complement of  $R_1$ ) regular?

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# A sketchy proof

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$$L = \{0^n 1^n \mid n \geq 0\} = \{\epsilon, 01, 0011, 000111, \dots\}.$$

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