# Computational Complexity

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## 1 State space

1. Memory vs. time
2. How do we manage space?
3. "Space-bounded" complexity classes.
4. Logarithmic and polynomial memory.

## 2 NL and NSPACE

1. Definition of **NSPACE**.
2. REACHABILITY is in **NL**.

## 3 L and NL-completeness

1. **L** vs. **NL**.
2. **NL**-completeness.
3. REACHABILITY is **NL**-complete.
4. Does **L** = **NL**?

## 4 Nondeterministic Space

1. Deterministic and nondeterministic computation gap.
2. Savitch's Theorem (without proof).

## 5 coNL vs. NL

1. Does **coNL** = **NL**?
2. The Immerman-Szelepcsényi Theorem (without proof).

## 6 Symmetric Space

1. UNDIRECTED REACHABILITY is in **SL**.
2. **SL** = **L**.