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- Definition of PSPACE, NPSPACE, coNPSPACE:
  - **PSPACE** := $\cup_{k\geq 1}$ SPACE[n^k].
  - **NPSPACE** := $\cup_{k\geq 1}$ NSPACE[n^k].
  - **coNPSPACE** := $\{L|\Sigma^* - L \in \text{NPSPACE}\}$.
- Definition of L, NL, coNL:
  - **L** := $\cup_{k\geq 1}$ SPACE[$\log n$].
  - **NL** := $\cup_{k\geq 1}$ NSPACE[$\log n$].
  - **coNL** := $\{L|\Sigma^* - L \in \text{NL}\}$.
- Obviously, we have L $\subseteq$ NL, P $\subseteq$ NP, and PSPACE $\subseteq$ NPSPACE.
- **Savitch's Theorem**: NSPACE($f(n)$) $\subseteq$ SPACE($f^2(n)$), where $f(n) \geq n$.
- L $\subseteq$ NL $\subseteq$ P $\subseteq$ NP $\subseteq$ PSPACE = NPSPACE.
- **Theorem**: **NSPACE = coNPSPACE**. If $L \in$ NSPACE[n^k], then $\Sigma^* - L \in$ NSPACE[n^k].
- **Theorem**: **NL = coNL**. If $L \in$ NSPACE[$\log n$], then $\Sigma^* - L \in$ NSPACE[$\log n$].
- Definition of NL-hard, NL-complete:
  - **NL-hard**: $\{L \mid \forall L' \in \text{NL}, L' \leq_{\log} L\}$.
  - **NL-complete**: $\{L \mid L \in \text{NL and } L \in \text{NL-hard}\}$.
- **Theorem**: Reachability is NL-complete.
- **Theorem**: True quantified Boolean formula (TQBF) is PSPACE-complete.