

We introduce **loopless top-k planning** and propose sound and complete approaches to it.



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Loopless Top-K Planning

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Motivation

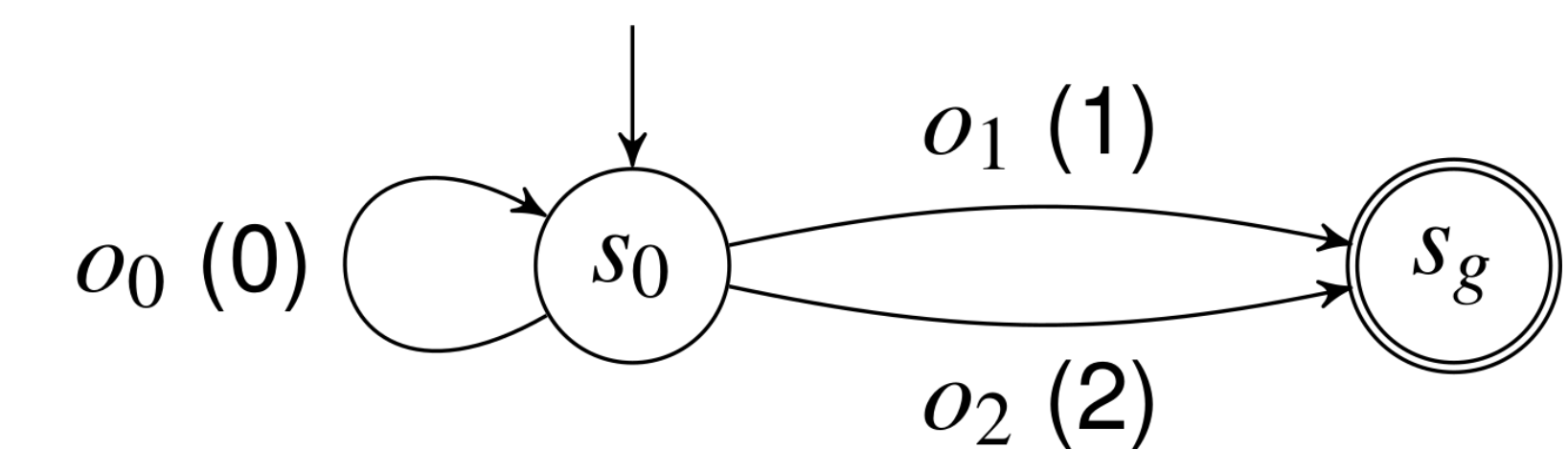
- Top-k planning: determine a set of k cheapest plans
- Solution set often contains plans that visit at least one state more than once

Loopless Top-k Planning

- Loopless plan: all visited states must be distinct
- Objective: find k loopless plan

Example

- Operators o_0, o_1, o_2 with $\text{cost}(o_i) = i$
- Infinitely many optimal plans with a cost of 1
- Two loopless plans (o_1) and (o_2)



Approaches

- Generate-and-test approach (SYM-K-GNT)
 - Uses an ordinary top-k planner
 - Sound but not complete
- Symbolic search approach (SYM-K-LL)
 - Modifies the plan reconstruction of symbolic search for top-k planning
 - Sound and complete

