GROUPING NODES WITH KNOWN VALUE DIFFERENCES: A LOSSLESS UCT-BASED ABSTRACTION ALGORITHM

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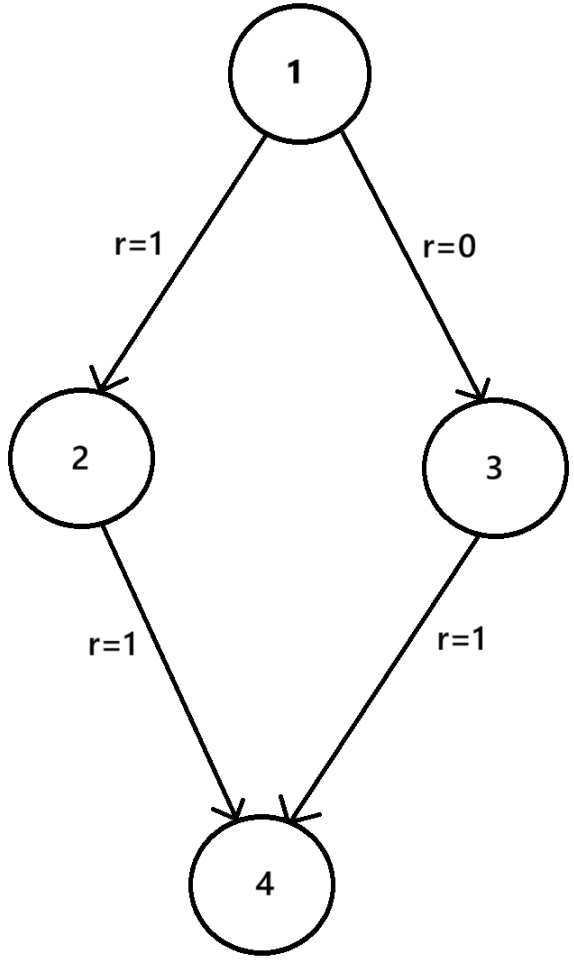
- UCT‘s performance heavily depends on its tree policy:

$$\mathrm{UCB}(s,a) = \underbrace{\frac{V_{(s,a)}}{N_{(s,a)}}}_{\text{Q term}} + \underbrace{\lambda\sqrt{\frac{\log\left(\sum_{a' \in \mathbb{A}(s)} N_{(s,a')}\right)}{N_{(s,a)}}}}_{\text{Exploration term}}$$

- **Goal**: Detect groups of state-action pairs and use aggregate statistics instead of the single-node statistics

- **Known Value Differences Abstractions** can be built on an UCT search graph:



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- It can be shown that KVDA is **sound**