

General Game Playing

NotSure

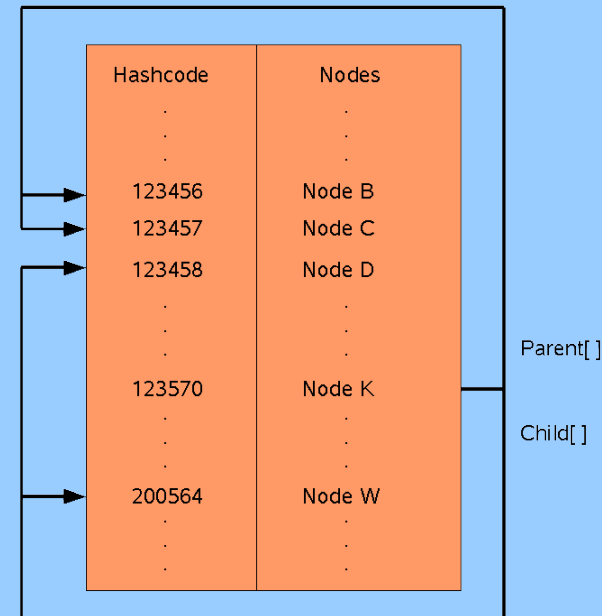
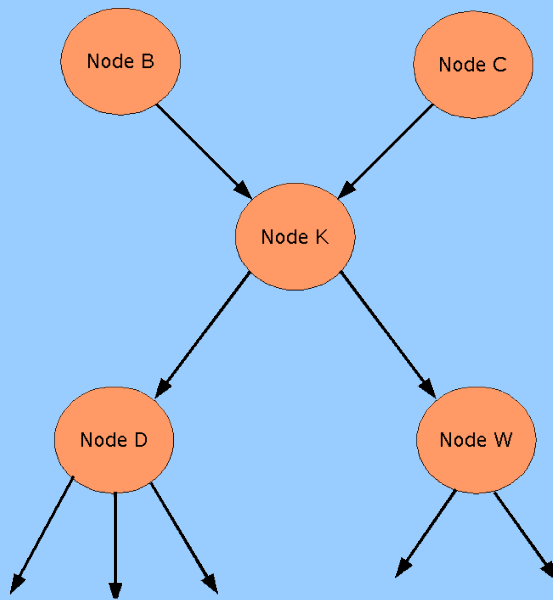


Outlines

1. NotSureTree
2. Expander/Heuristics
3. GDL Improvement
4. Problems & Solutions
 1. Soft References
 2. Garbage Collection

NotSureTree

- Basic Java Player
- Nodes inspired by IGameNode
- Node can have more than one parent
- Nodes identified by Hashcode

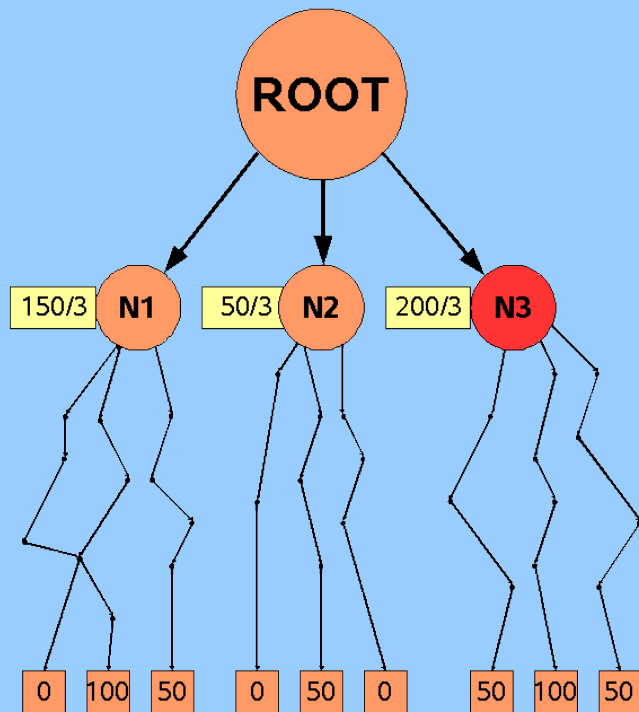


Expander/Heuristics

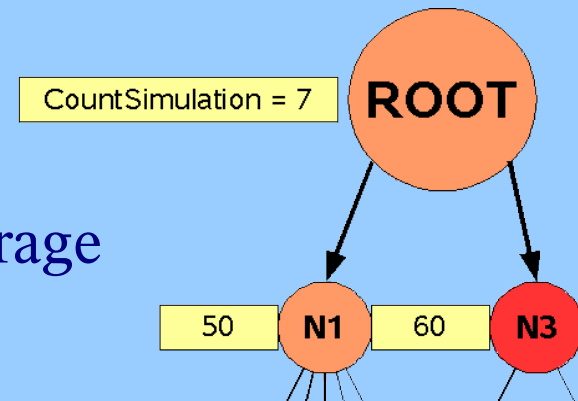
- BreadthFirstSearch till defined depth
 - MonteCarlo Game Simulation
 - Score of terminalnode is given to the simulated node
 - Calculating the average (weighted)
 - Best Move:
 1. expanded Tree (Min/Max)
 2. best average simulation
 3. Mobility
 4. Novelty
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Expander/Heuristics

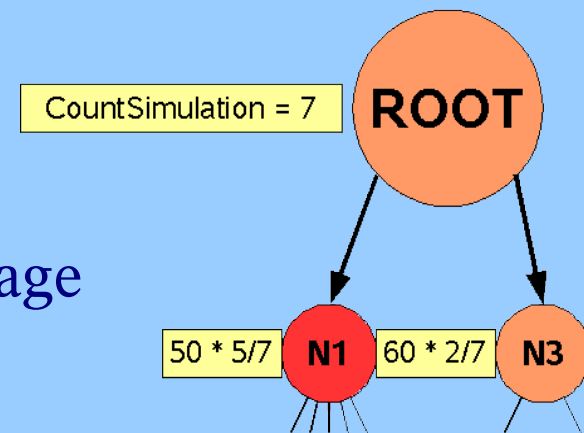
MonteCarlo



Standard average



Weighted average



GDL Improvement

- Parsen
 - variable name independent game recognition (reuse data from old games)
 - > lower memory consumption for storing moves and states
- Reordering GDL rules by length
- Conjunct Ordering

Problems & Solutions

- **Too large memory**
 - High memory costs, even for simple games with few nodes
 - **Solved by: Using Soft References and SoftHashMap**
 - Only a few nodes are referenced in HashMap
 - Others are stored in SoftHashMap
 - In case of overflow references are overwritten and the affected nodes are swapped out in database

- **Timeouts**
 - Best move is calculated but done too late
 - Player is stopped by Carbage Collector which deletes unreferenced nodes
 - Player gets free memory capacity but it takes up to 6 seconds
 - **Solved by: Selecting another Garbage Collector (parallel)**
 - Collector is started manually if there are enough resources