



Architektur und Implementierung von Datenbanksystemen

Task 9

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Legacy Query Planner

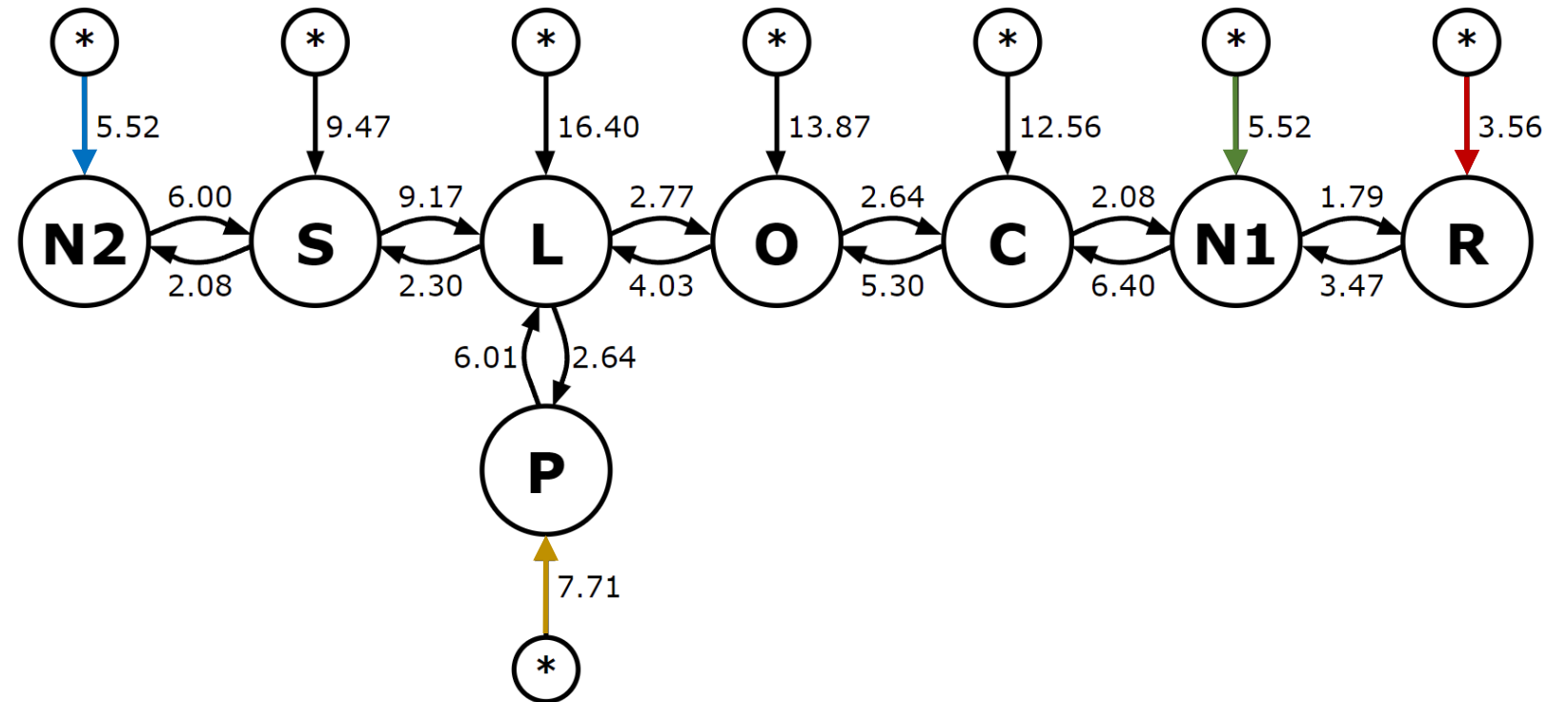
- Joins are represented in a graph
- Nearest Neighbors
 - find the cheapest path to node
 - find cheapest path to another node
 - repeat until all nodes visited
- may find very inefficient execution plans

Next-Generation Query Planner

- Joins are represented in a weighted, directed graph
- N Nearest Neighbors (N3)
 - looks for N shortest paths (in each step)
 - choosing N
 - $N = 1$; for simple queries
 - $N = 5$; for two-way joins
 - $N = 10$; for joins with three or more tables

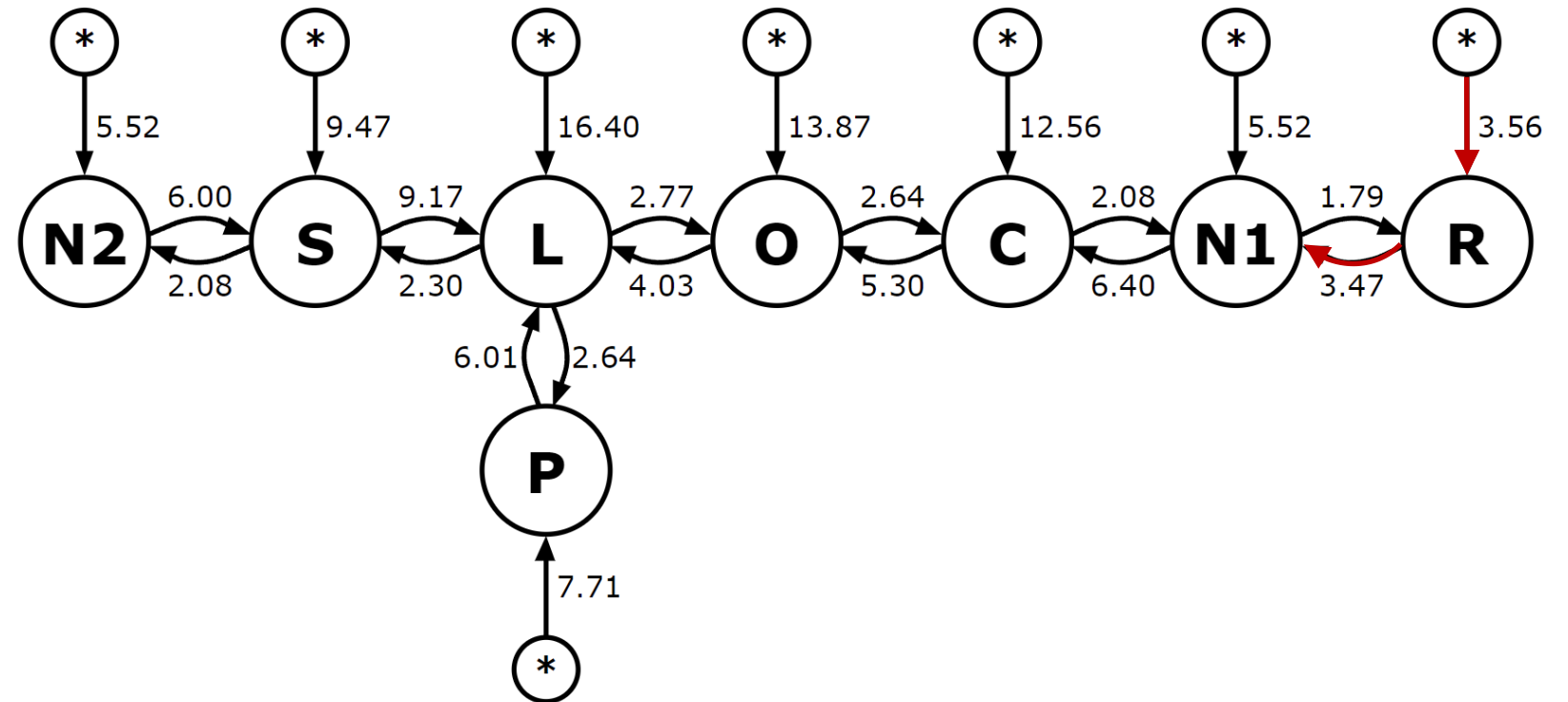
Example (N = 4), first step

Path	Cost
R	3.56
N1	5.52
N2	5.52
P	7.71



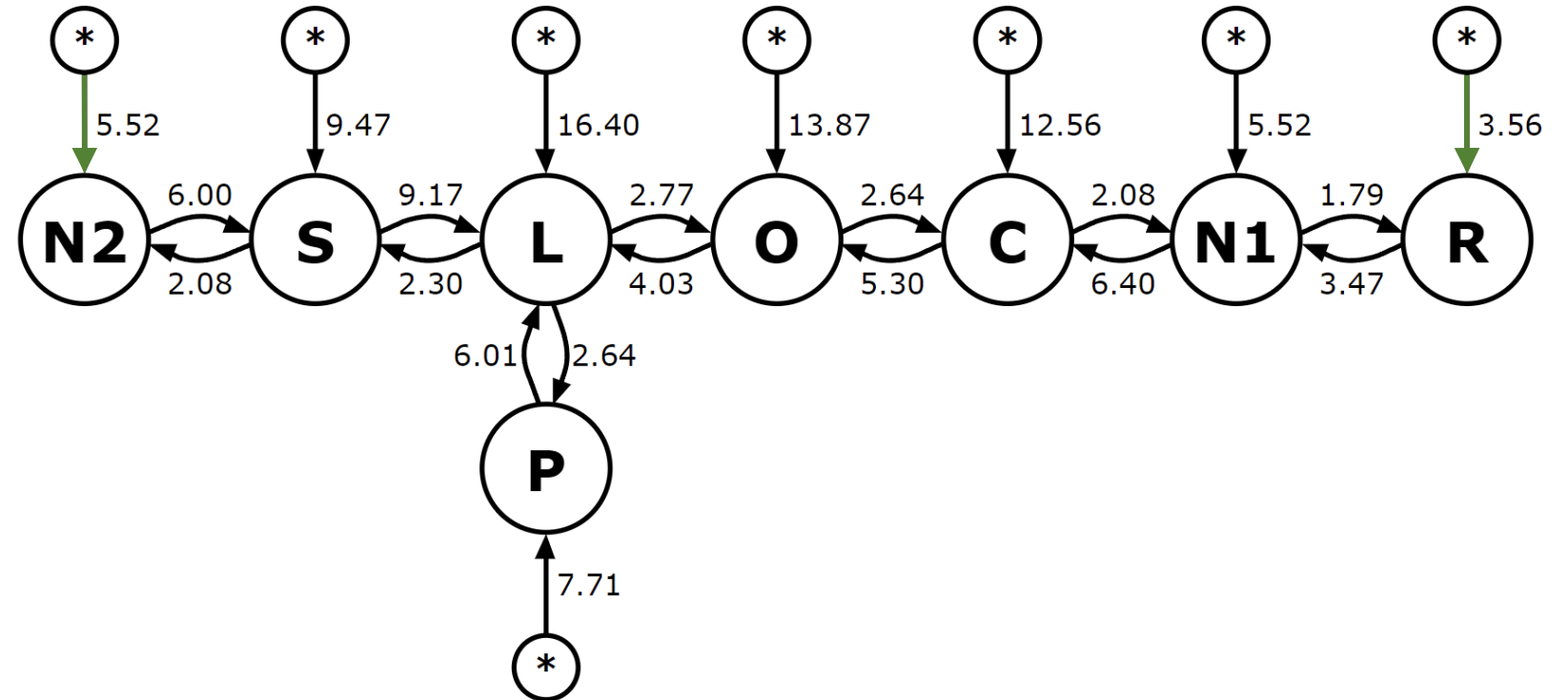
Example (N = 4), second step

Path	Cost
R-N1	7.03
R-N2	9.08
N2-N1	11.04
R-P	11.27



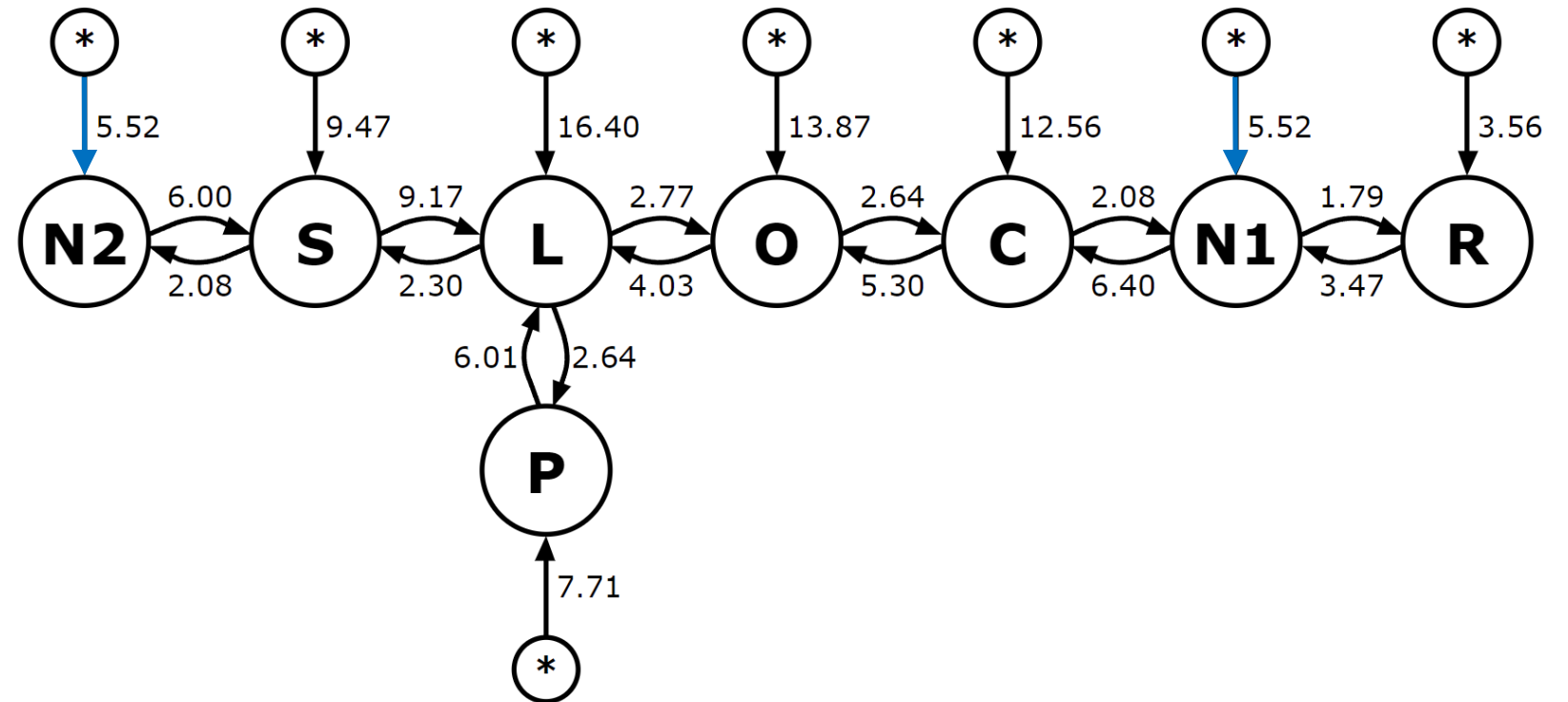
Example (N = 4), second step

Path	Cost
R-N1	7.03
R-N2	9.08
N2-N1	11.04
R-P	11.27



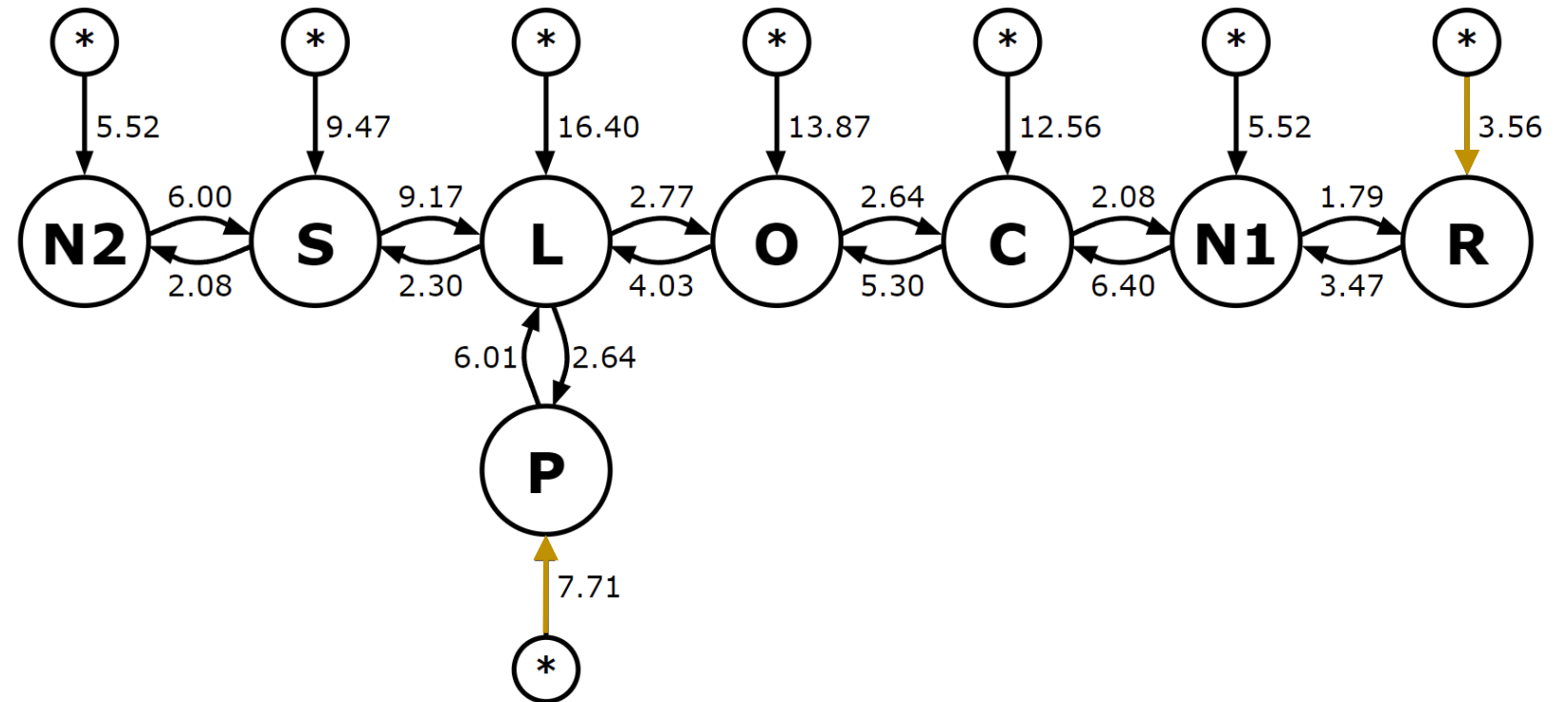
Example (N = 4), second step

Path	Cost
R-N1	7.03
R-N2	9.08
N2-N1	11.04
R-P	11.27



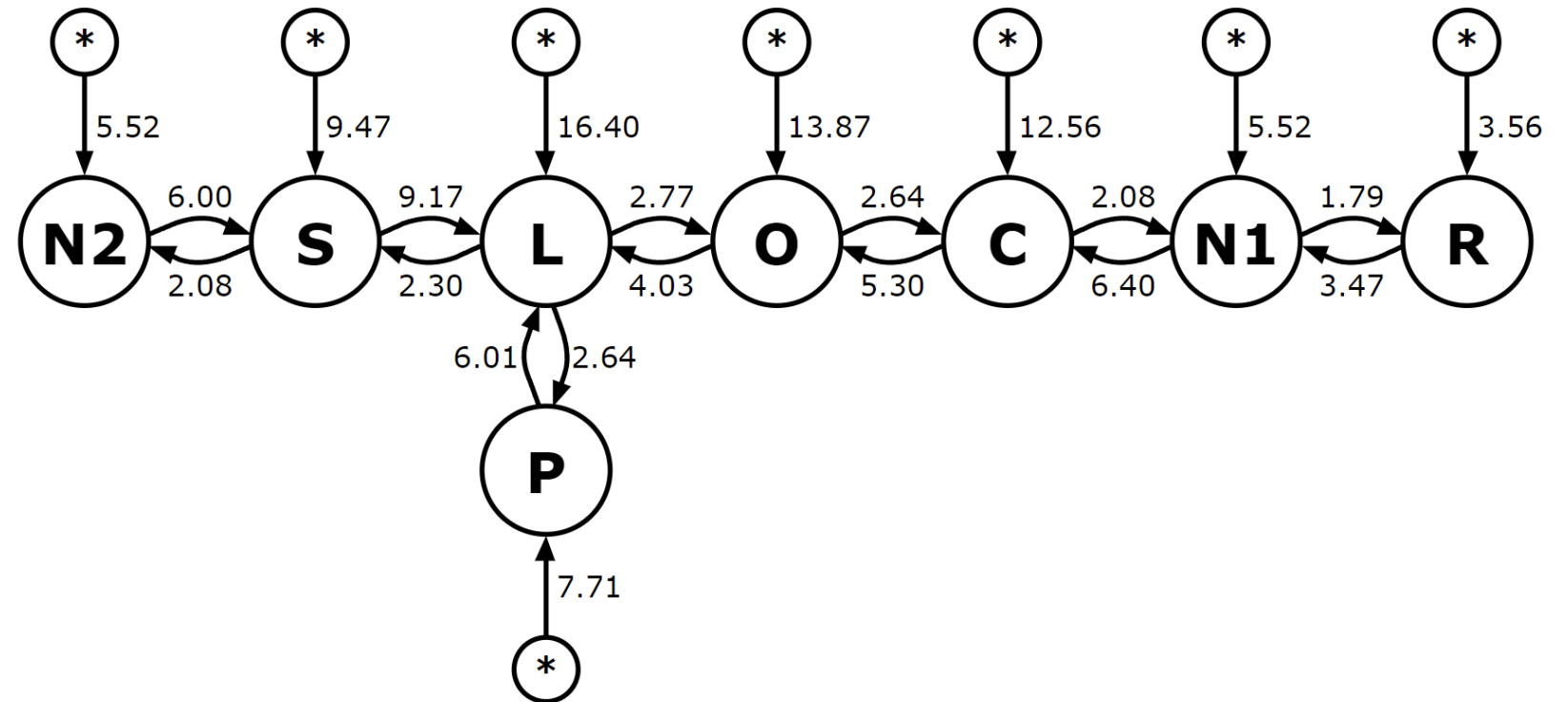
Example (N = 4), second step

Path	Cost
R-N1	7.03
R-N2	9.08
N2-N1	11.04
R-P	11.27



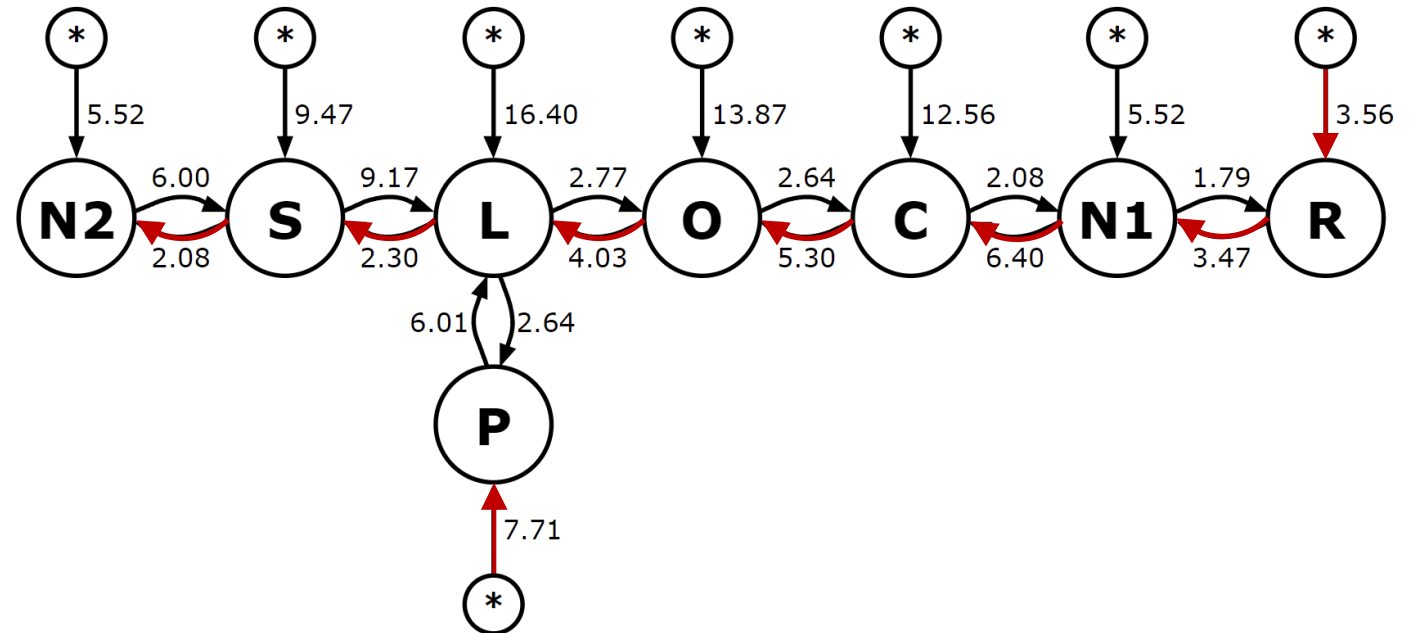
Example (N = 4), third step

Path	Cost
R-N1-N2	12.55
R-N1-C	13.43
R-N1-P	14.74
R-N2-S	15.08



Next-Generation Query Planner

- algorithm continues until all nodes were visited in one path
 - > 8 iterations
- path cost found with different Planners:
 - LQP: 36.92
 - NGQP: 29.78



Advantages & Disadvantages

- Pro:
 - finds better optimizations than legacy planner
 - especially for complex queries
- Contra
 - plans are still not optimal
 - cost guesses rely on accurate ANALYZE data

References

- <https://sqlite.org/queryplanner-ng.html>

