

개요

정보 기반 탐색

- 목표 상태에 관한 도메인 지식을 활용하여 탐색

I. 탐욕적 최선 우선 탐색

II. A*(에이 스타) 탐색

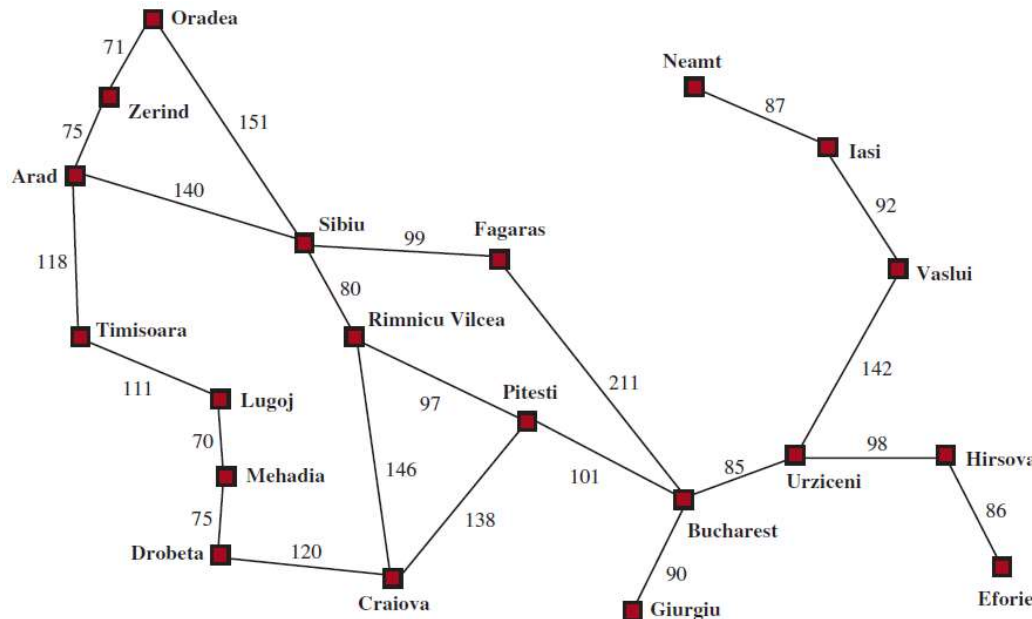
I. 정보 기반 (휴리스틱) 탐색

목표 지점을 찾을 때 해당 **도메인의 지식**을 사용하면 해를 좀더 효율적으로 찾을 수 있음

휴리스틱 함수:

$h(n)$ = 노드 n 상태에서 목표 상태로 가는 가장 저렴한 경로를 계산

예) 지도 상에서 두 도시간의 직선거리(straight-line distance) h_{SLD}



Arad	366	Mehadia	241
Bucharest	0	Neamt	234
Craiova	160	Oradea	380
Drobeta	242	Pitesti	100
Eforie	161	Rimnicu Vilcea	193
Fagaras	176	Sibiu	253
Giurgiu	77	Timisoara	329
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Lugoj	244	Zerind	374

부카레스트 까지 직선 거리

탐욕적 최선 우선 탐색

평가 함수 $f(n) = h(n)$

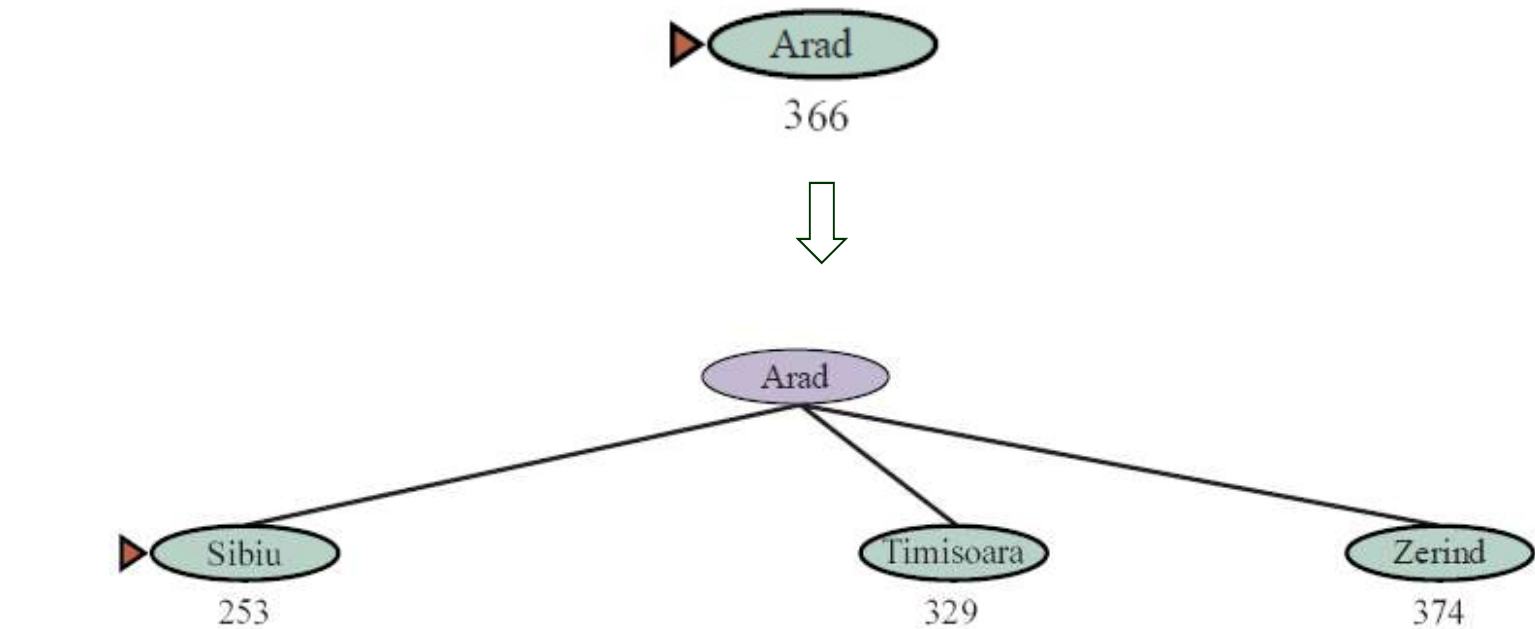
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$$f(n) = h_{SLD}(n)$$

도로 상의 길이와 연관도가 높음



부카레스트까지 탐욕적 탐색

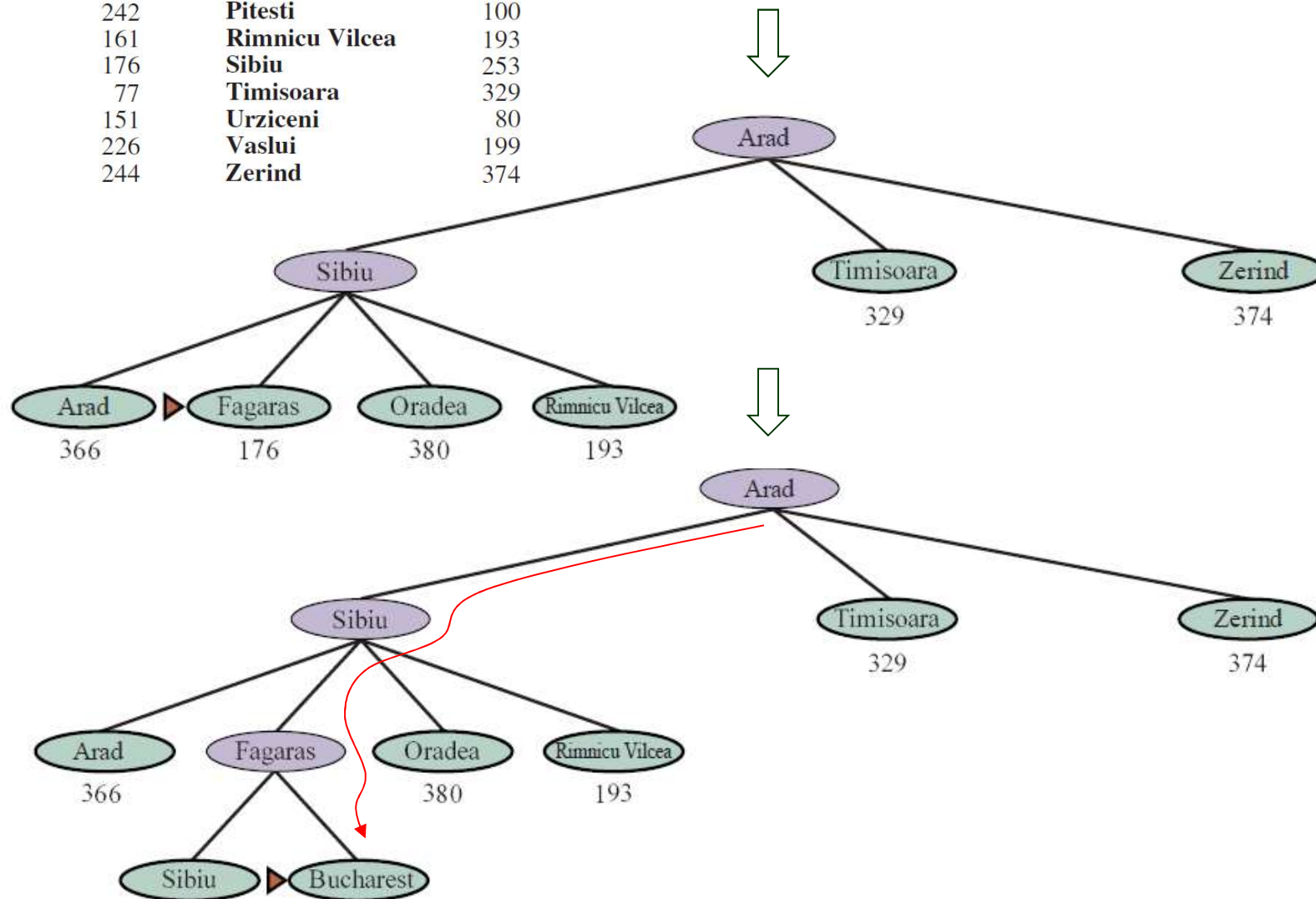


제린드나 티미소아라 보다
부카레스트에 가까움

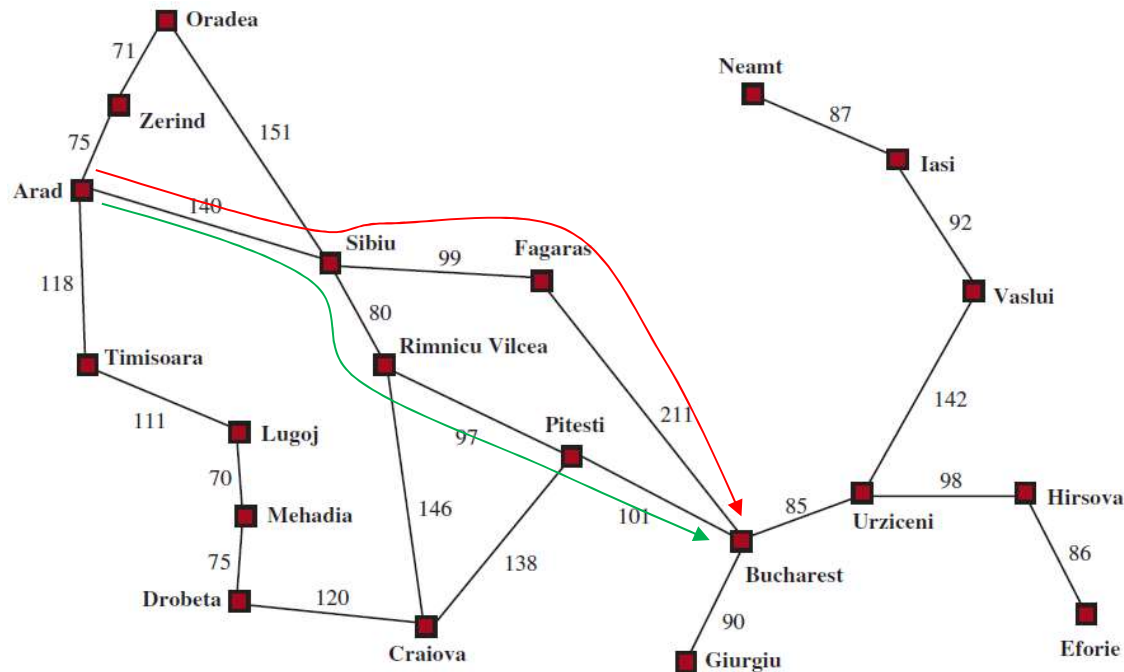
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부카레스트까지 탐욕적 탐색 (cont'd)

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탐욕적 \neq 최적



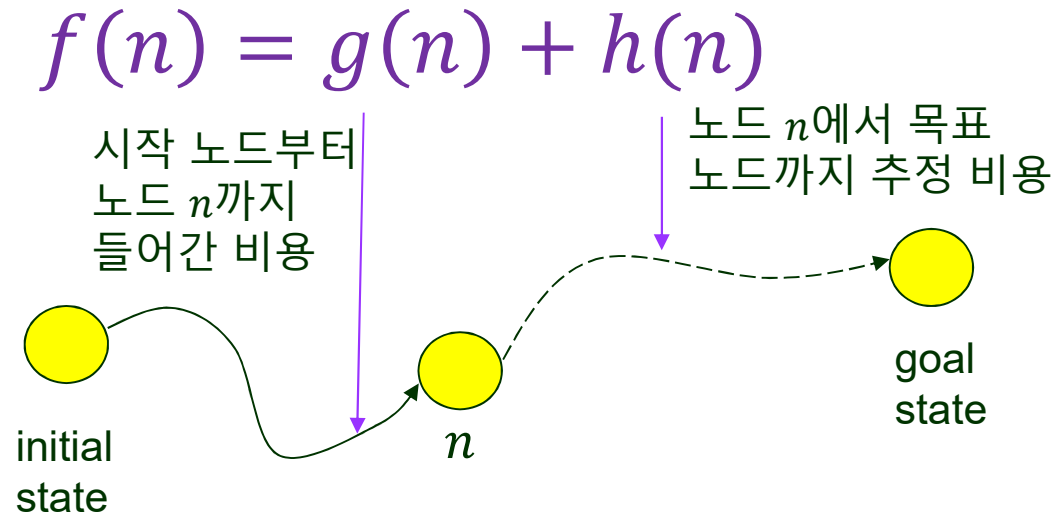
탐욕적 해: Arad – Sibiu – Fagaras – Bucharest (450)

최적 해: Arad – Sibiu – Rimnicu Vilcea – Pitesti – Bucharest (418)

탐욕 전략은 현재 상태까지 오는데 들어간 비용을 고려하지 않음

II. A* 탐색 알고리즘

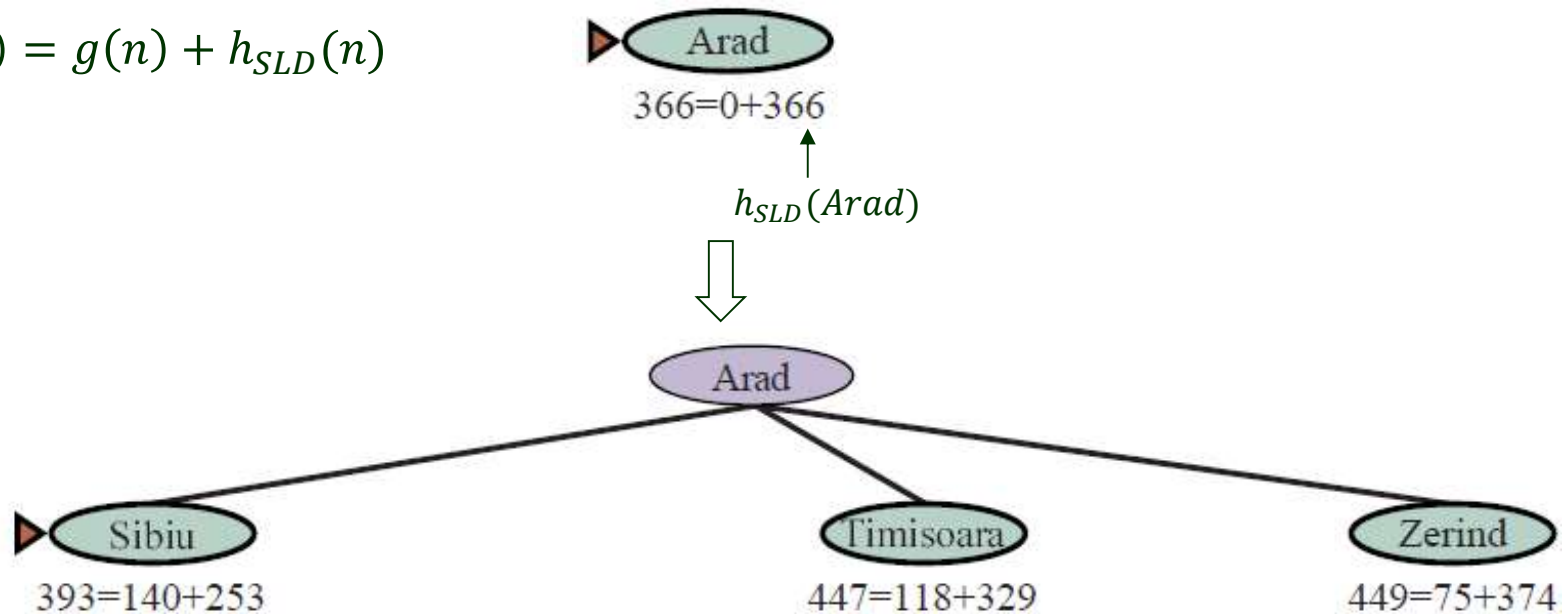
P. E. Hart, N. J. Nilsson, and B. Raphael (1968)



$f(n)$: 시작 노드부터 노드 n 을 거쳐 목표 노드까지 가는 최적 경로에 대한 **추정 비용**

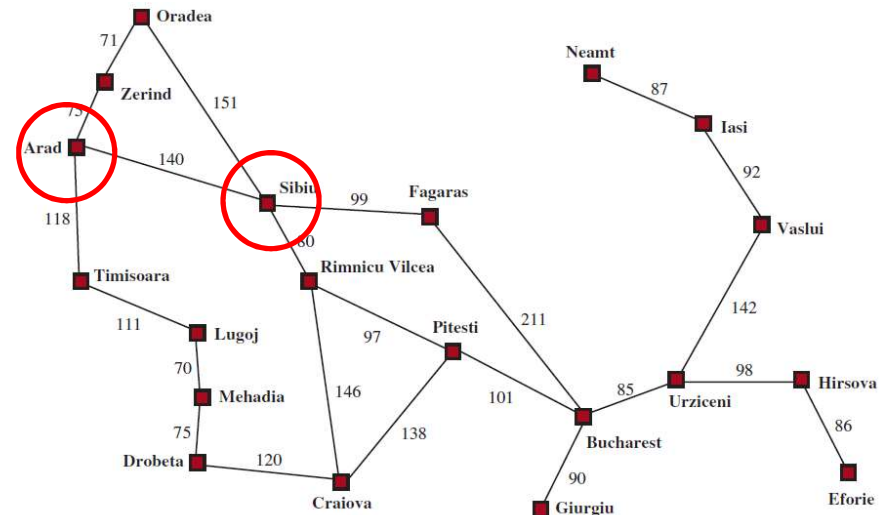
A* 알고리즘 경로 계획에 적용

$$f(n) = g(n) + h_{SLD}(n)$$

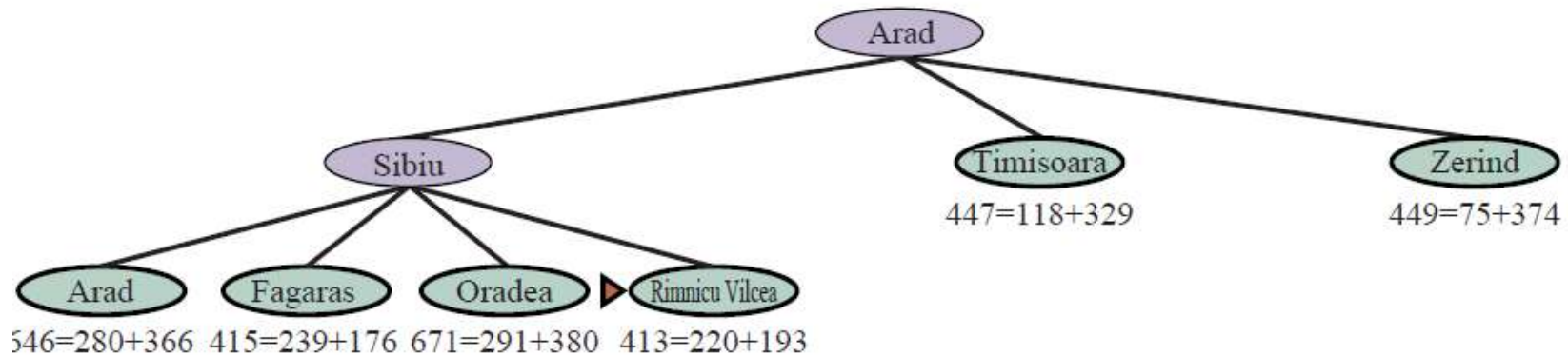


h_{SLD} : straight-line distance (직선 거리)

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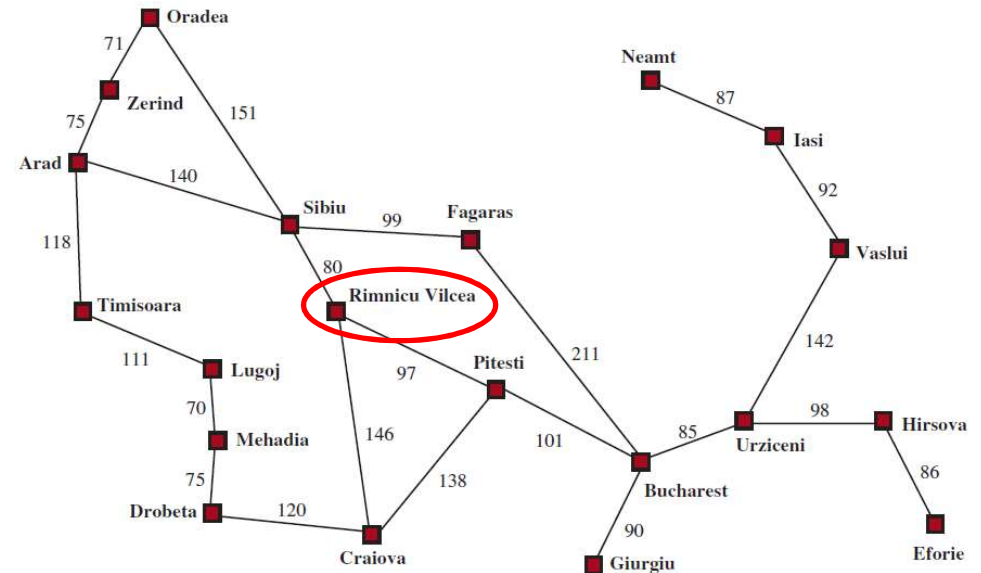


A* 알고리즘 경로 계획에 적용 (cont'd)

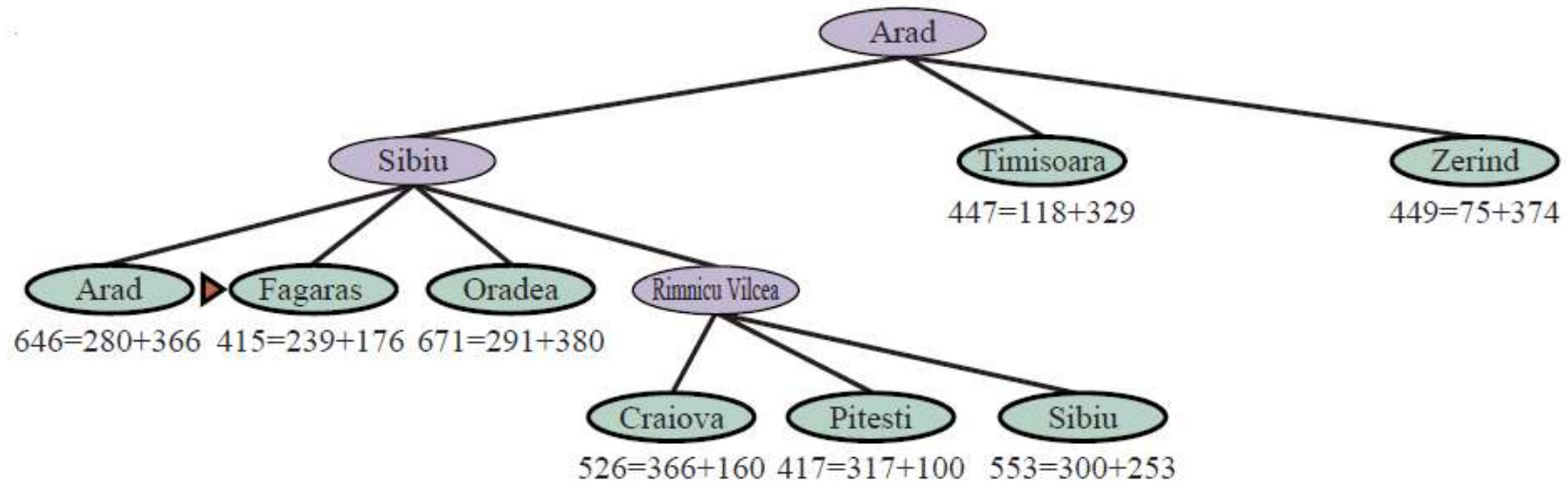


h_{SLD} : straight-line distance

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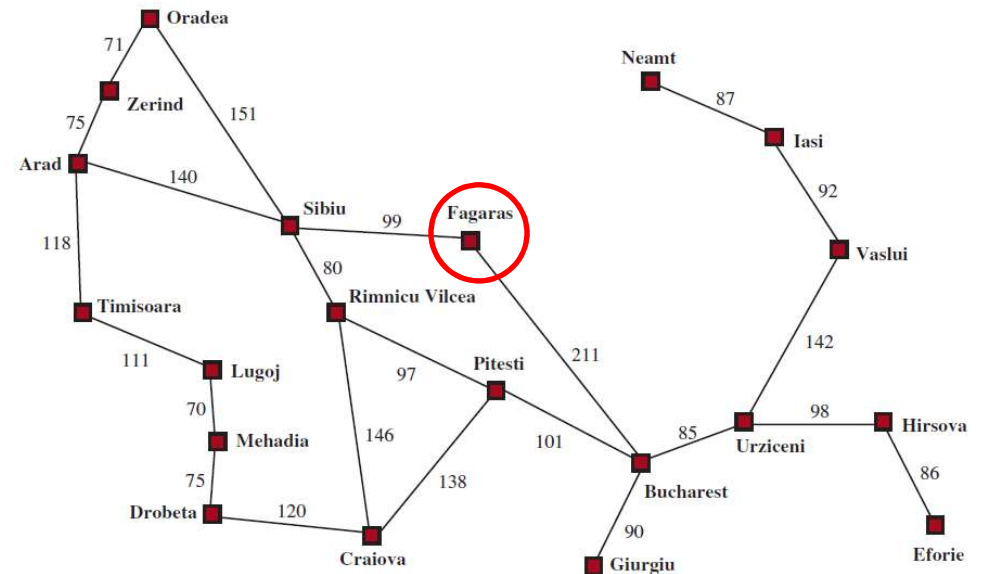


A* 알고리즘 경로 계획에 적용 (cont'd)

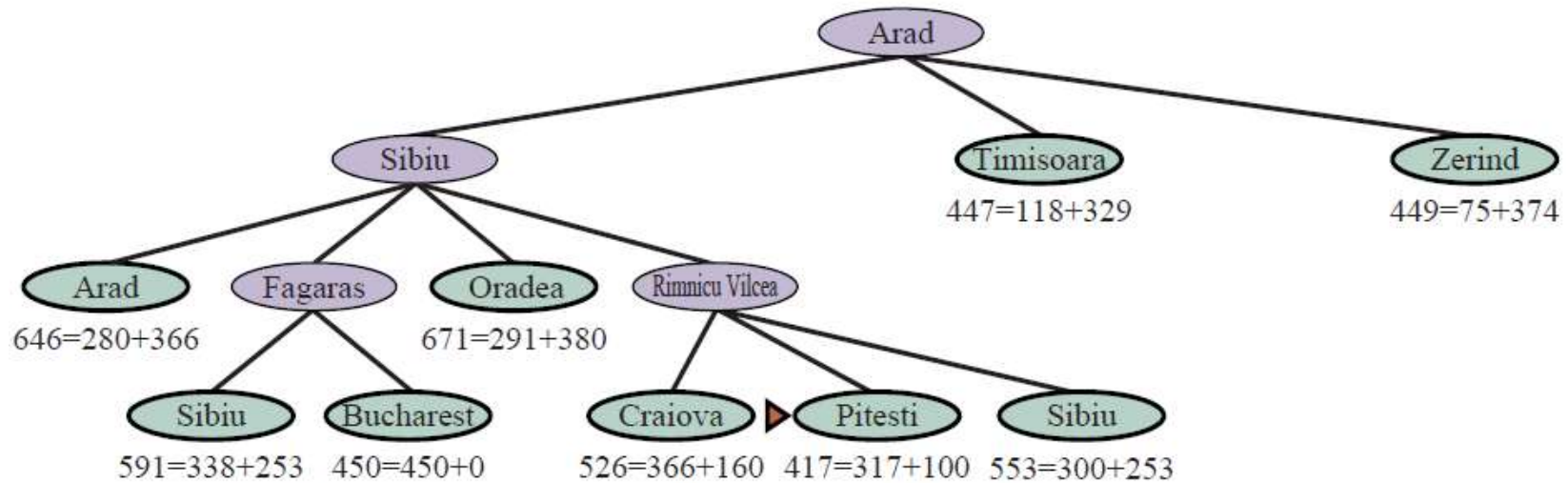


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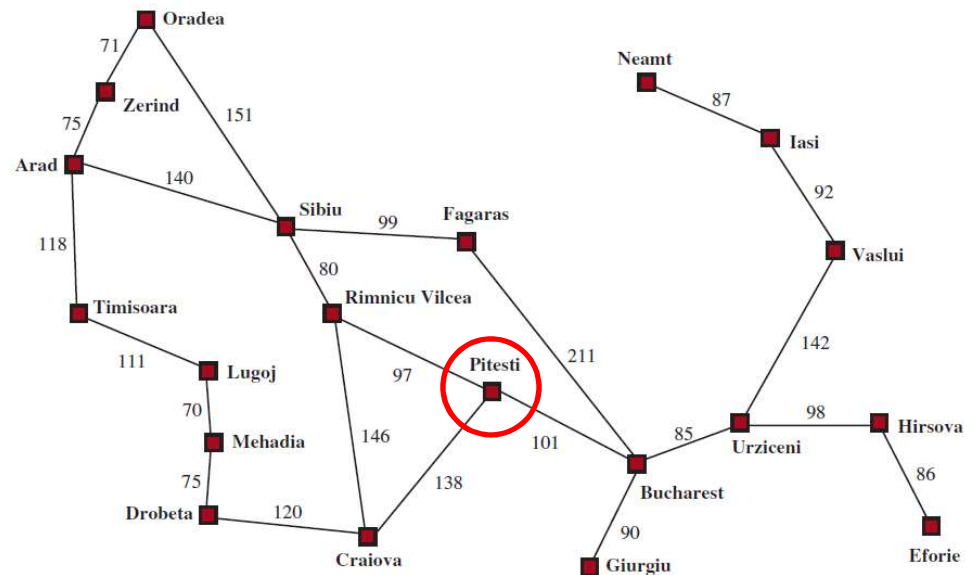


A* 알고리즘 경로 계획에 적용 (cont'd)

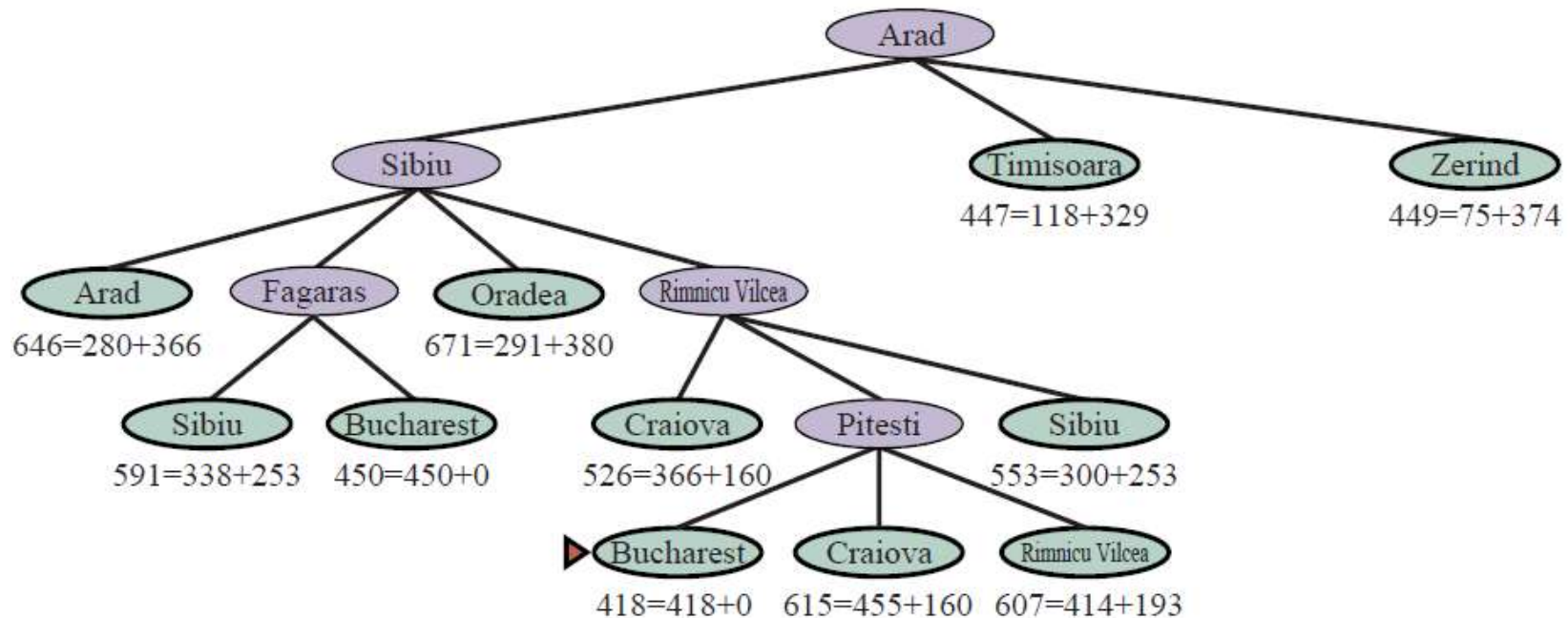


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A* 알고리즘 경로 계획에 적용 (cont'd)



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