Search
CS 470 Introduction To Artificial Intelligence

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Outline

Search problem in AI

Search

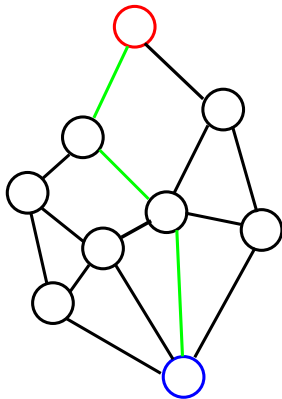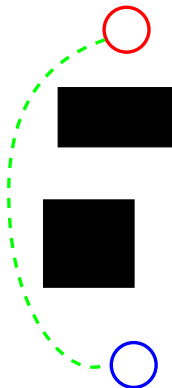- initial state
- goal state
- state transition sequence
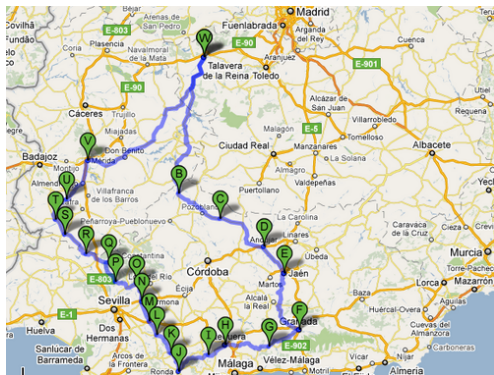
Search problem in AI

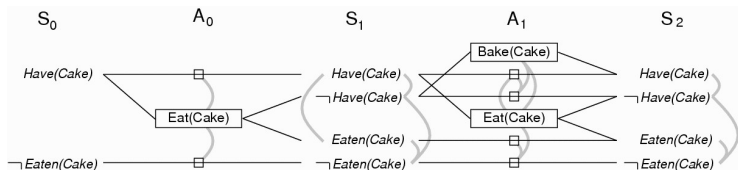## Problem space

Discrete

Continuous

Application

Routing planning

Application

Scheduling

Application

Robot action planning
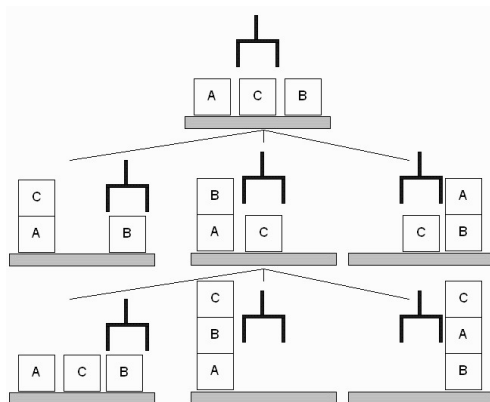
Application

Air ticket planning
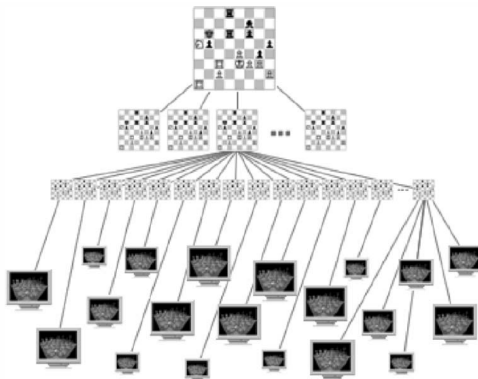
Application

Nature language generation
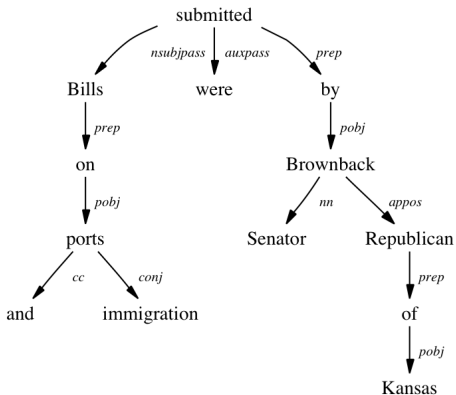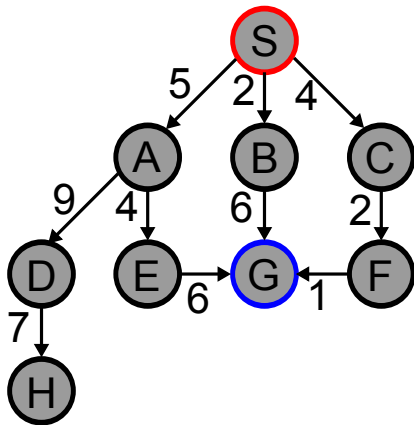
Application

Game

Search method

- Breadth-First Search
- Depth-First Search
- Uniform-Cost Search

- Depth-limited search
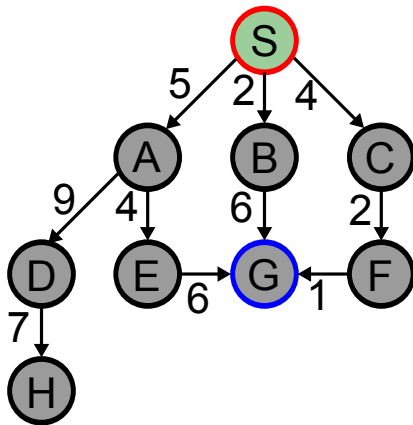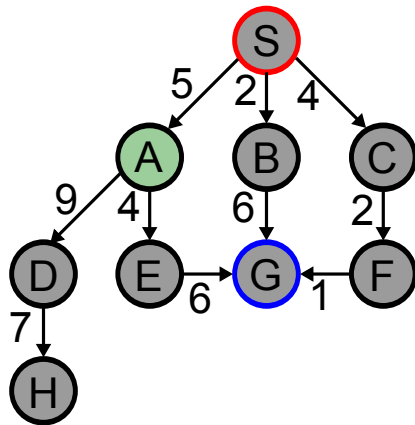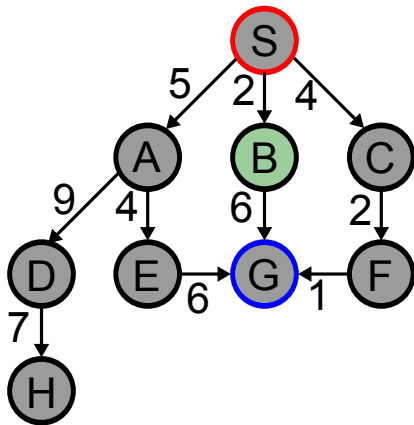- Iterative-Deepening Search
- Bi-directional search

Breadth-first search

Breadth-first search

Breadth-first search

Breadth-first search

Breadth-first search

Breadth-first search
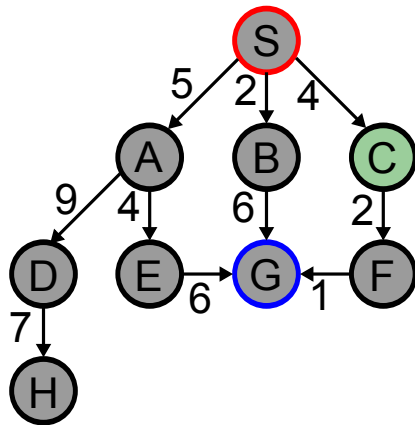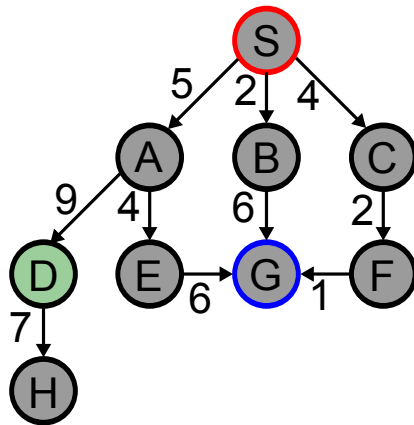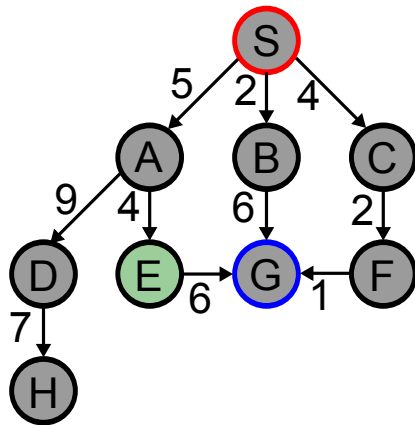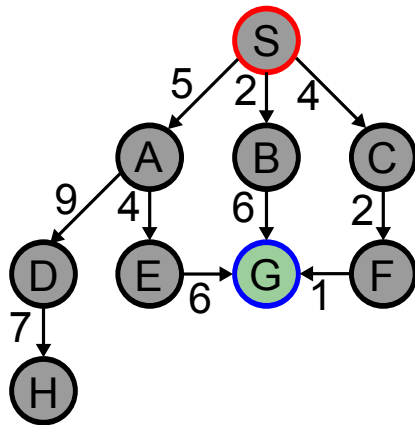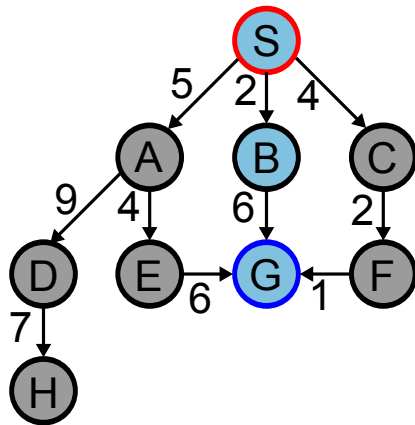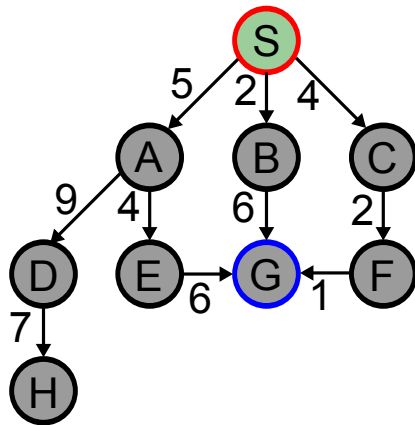
Breadth-first search

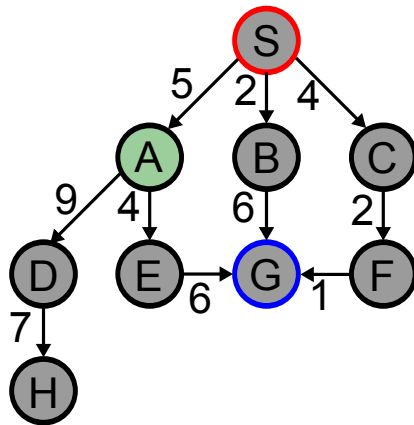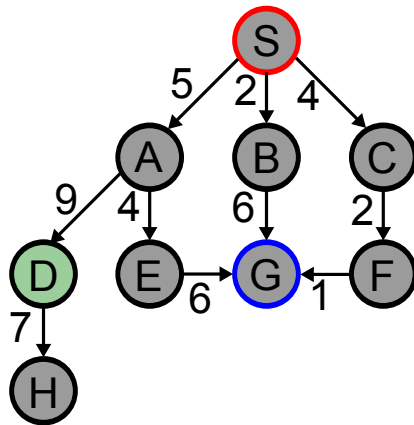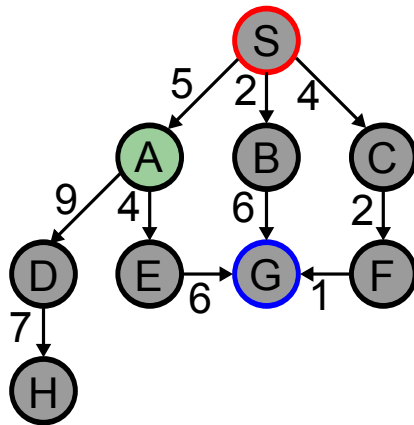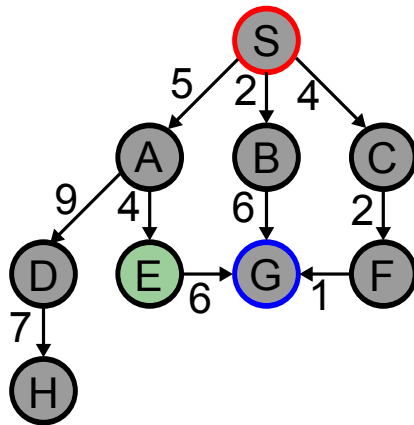# Breadth-first search

Breadth-first search

Depth-first search

Depth-first search
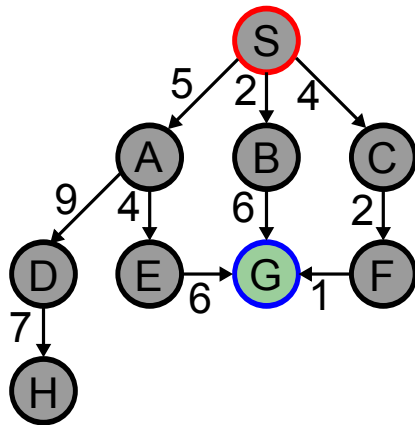
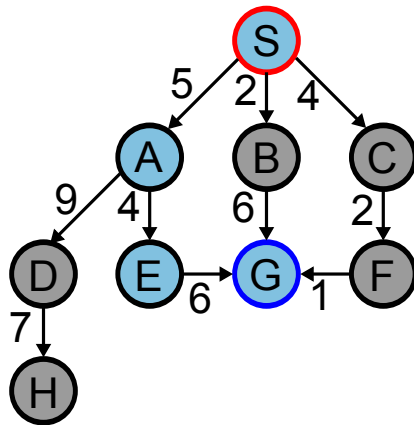# Depth-first search

Depth-first search

Depth-first search
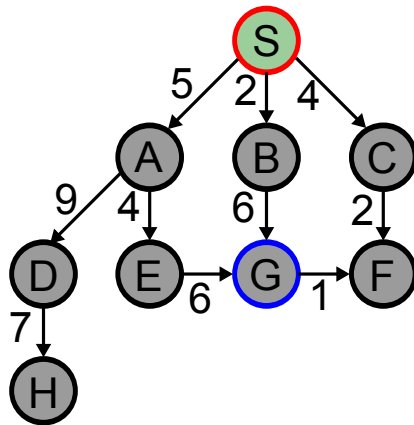
Depth-first search

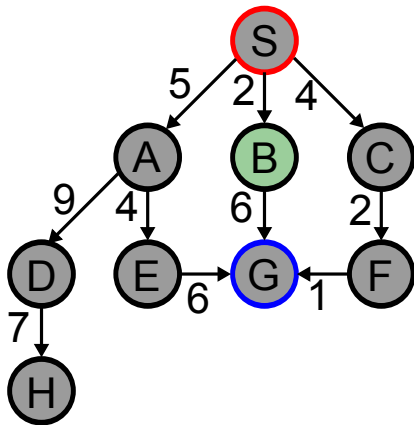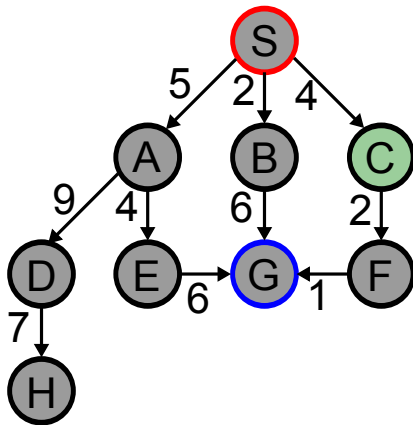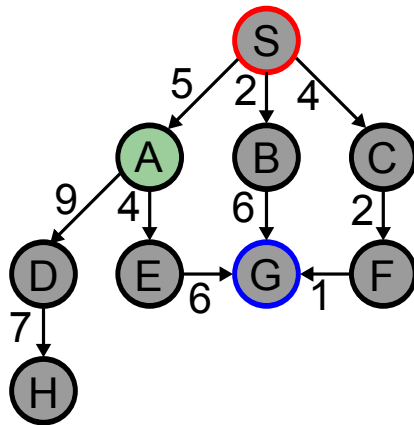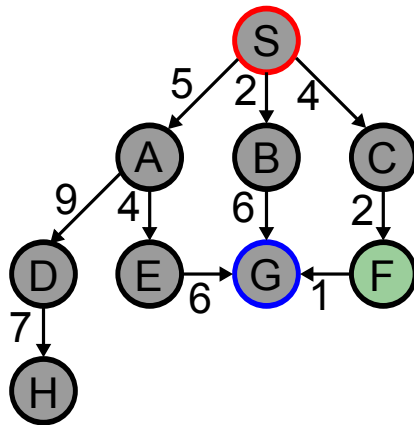# Depth-first search

Uniform-cost search

Uniform-cost search

Uniform-cost search

Uniform-cost search

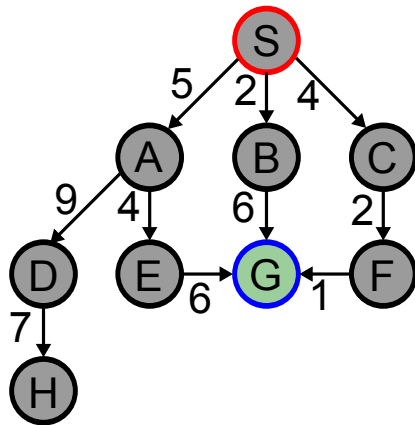## Uniform-cost search

Uniform-cost search

Uniform-cost search

Iterative-Deepening Search

Iterative-Deepening Search

Iterative-Deepening Search

Iterative-Deepening Search

Iterative-Deepening Search
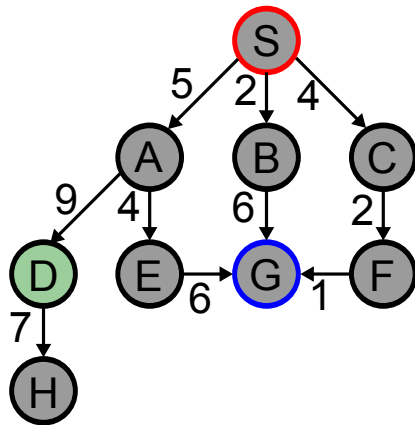
Iterative-Deepening Search
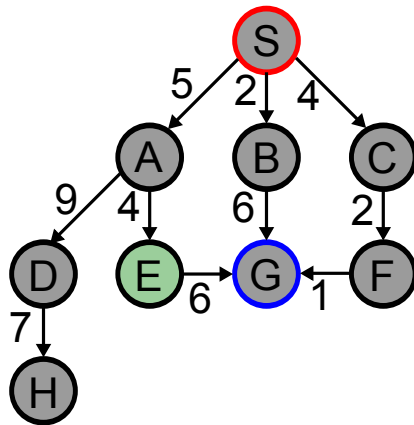
Iterative-Deepening Search
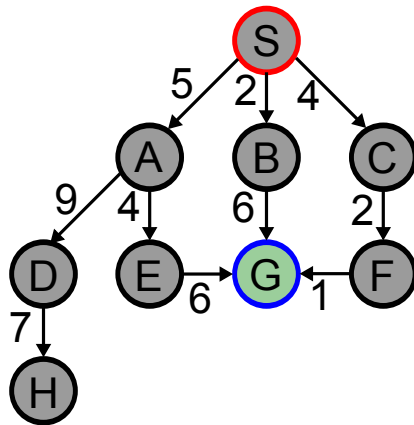
Search method

- Greedy Best-First Search
- A* Search

- IDA* Search
- SMA* Search

Greedy Best-First Search

Greedy Best-First Search
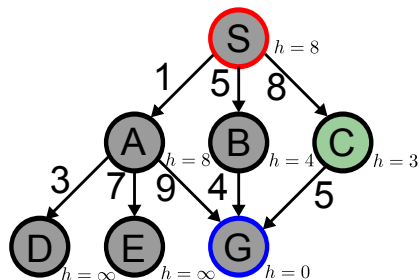
Greedy Best-First Search
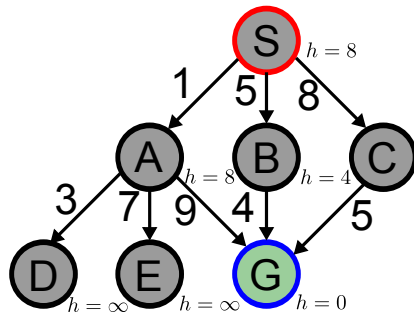
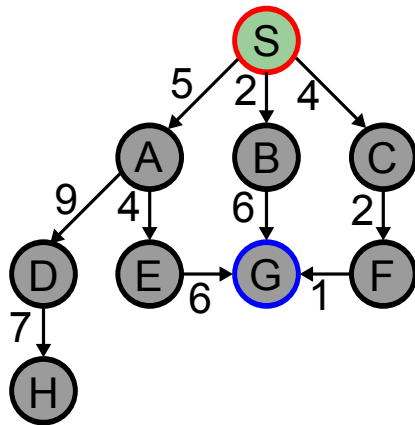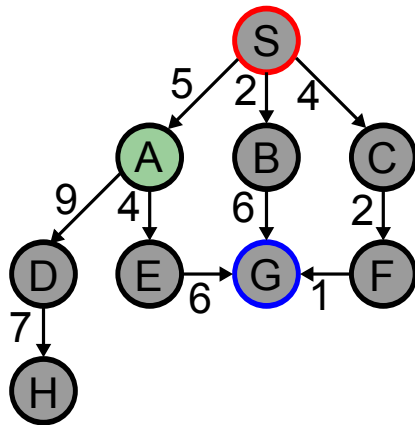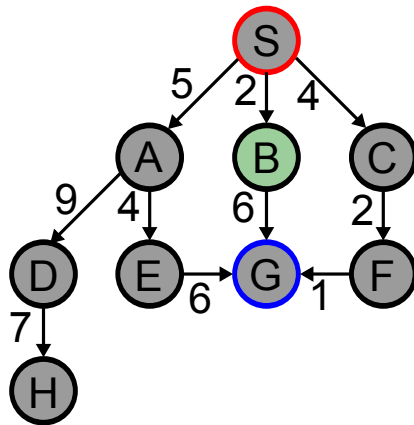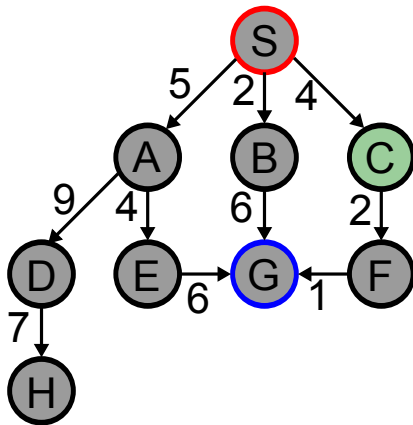# Greedy Best-First Search
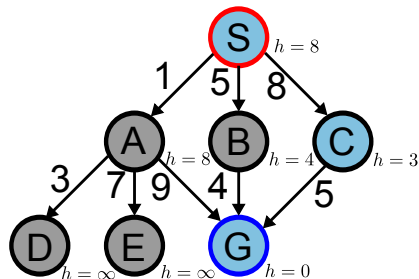
A*

Node	g	h	f
S	0	8	8
A			
B			
C			
D			
E			
G			

A*

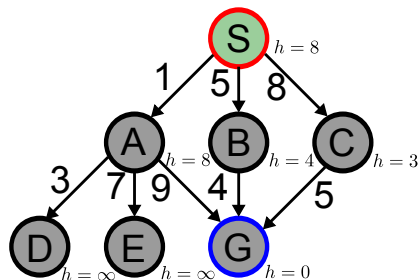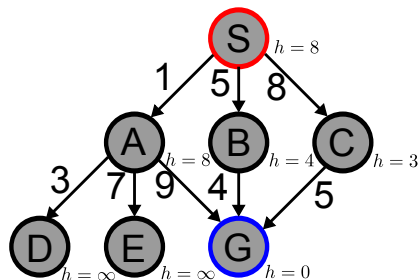| Node	g	h	f
S	0	8	8
A	1	8	9
B	5	4	9
C	8	3	11
D			
E			
G			

A*
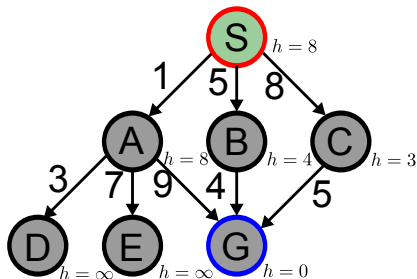
Node	g	h	f
S	0	8	8
A	1	8	9
B	5	4	9
C	8	3	11
D	4	∞	∞
E	8	∞	∞
G	10	0	10

A*

Node	g	h	f
S	0	8	8
A	1	8	9
B	5	4	9
C	8	3	11
D	4	∞	∞
E	8	∞	∞
G	9	0	9

A*