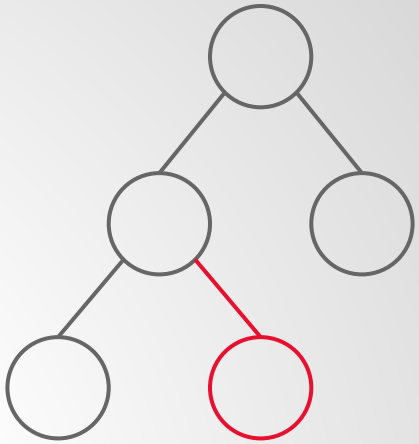

SimpleAI

Artificial Intelligence Python lib

Juan Pedro Fisanotti

"fisa"

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work with python, django, AI, ... at

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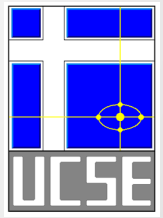
work with python, django, AI, ... at

teach web engineering and AI at



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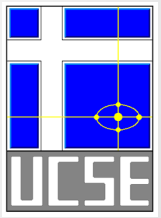

member (mail list, events, projects) of

SimpleAI

SimpleAI

- implement algorithms from AIMA book

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- alternative to aima-python

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- focus on **simple API** and **docs**

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- modern, "pythonic"

SimpleAI

- implement algorithms from AIMA book
- alternative to aima-python
- focus on **simple API** and **docs**
- modern, "pythonic"
- tests!

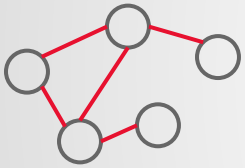
Search problems

Search problems

set of states

Search problems

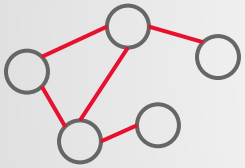
set of states



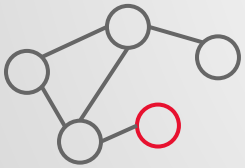
actions connect states

Search problems

set of states



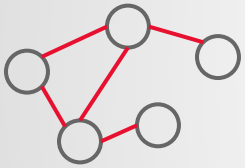
actions connect states



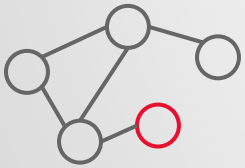
find goal states, or

Search problems

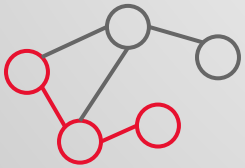
set of states



actions connect states



find goal states, or



find paths to goal states

Example: the 8-puzzle

Example: the 8-puzzle

initial state

4	5	1
8	3	7
	6	2

Example: the 8-puzzle

initial state

4	5	1
8	3	7
	6	2

action:
move 8

4	5	1
	3	7
8	6	2

action:
move 6

4	5	1
8	3	7
6		2

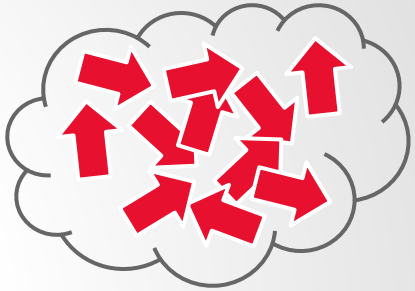
Example: the 8-puzzle

initial state

4	5	1
8	3	7
	6	2

action:
move 8

4	5	1
	3	7
8	6	2



action:
move 6

4	5	1
8	3	7
6		2

1	2	3
4	5	6
7	8	

goal state

Why the 8-puzzle?

Why the 8-puzzle?

- toy problem

Why the 8-puzzle?

- toy problem

- brute force is **really** bad

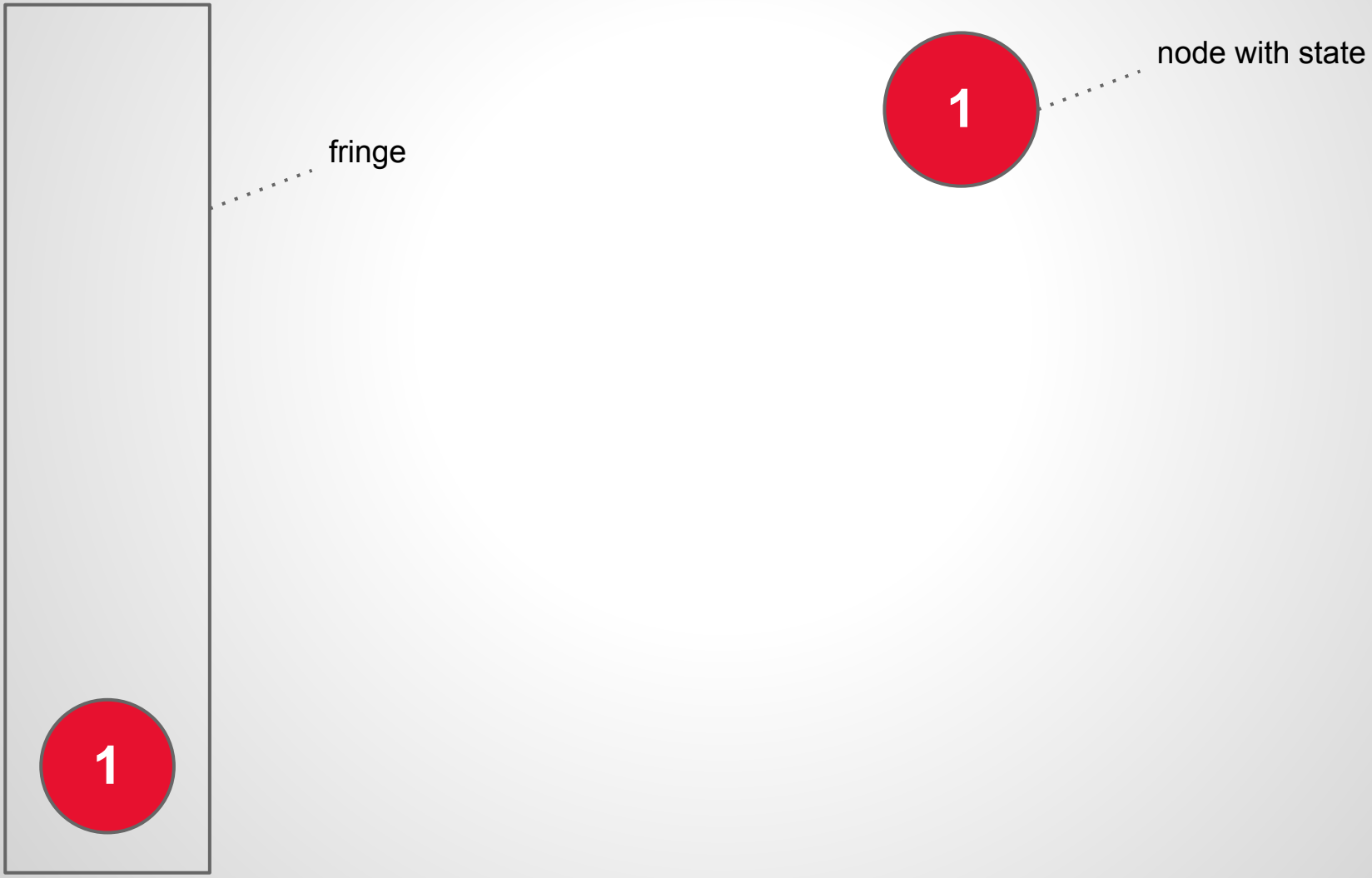
  (hope you have enough terabytes of RAM)

Traditional search algorithm

(basic notion)

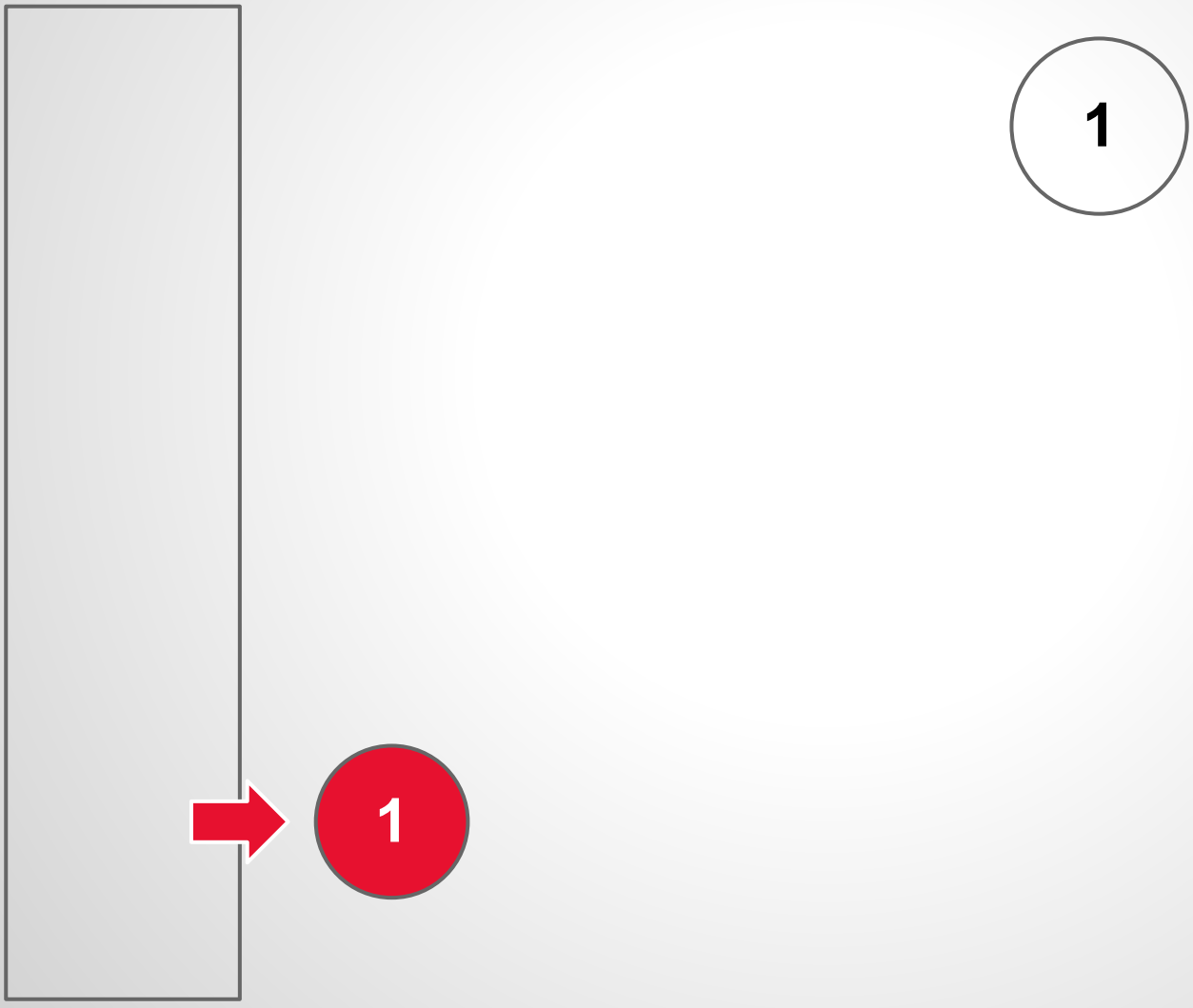
```
fringe = new bag for "pending" nodes
initial = new node with initial state
fringe.append(initial)

while fringe not empty:
    node = fringe.magick_pop()
    if node.state is goal:
        return node
    else:
        children = other nodes we can reach from node
        fringe.append(children)
```

Start with initial in fringe

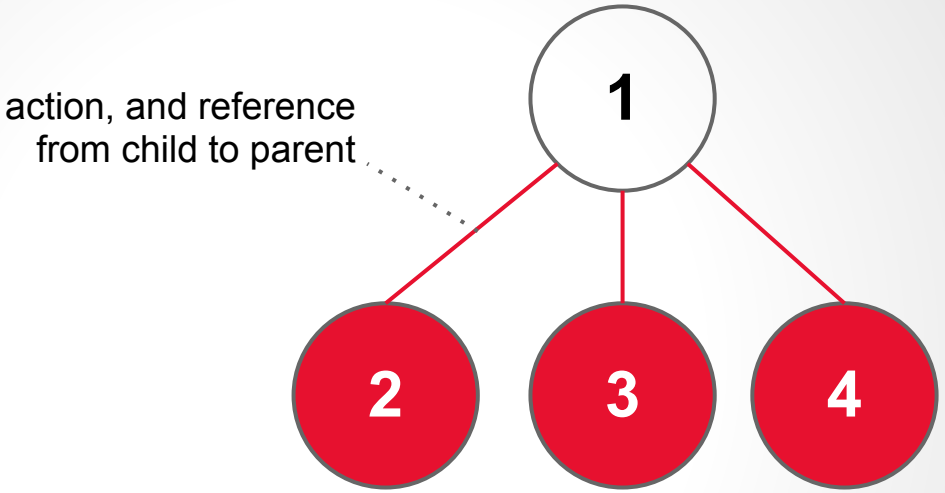


Loop: new iteration

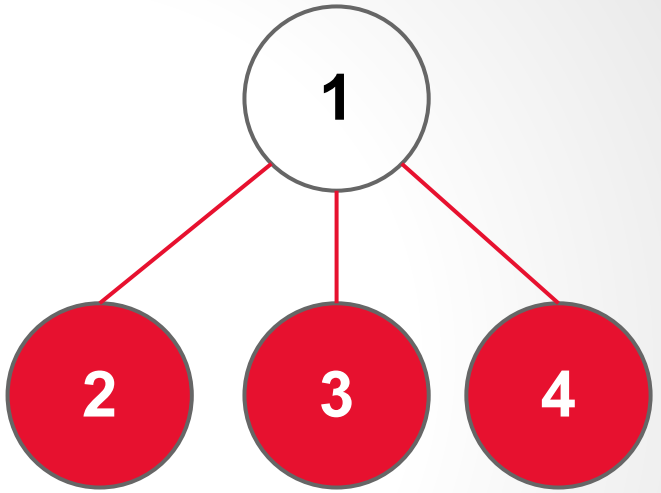
Loop: pop node from fringe



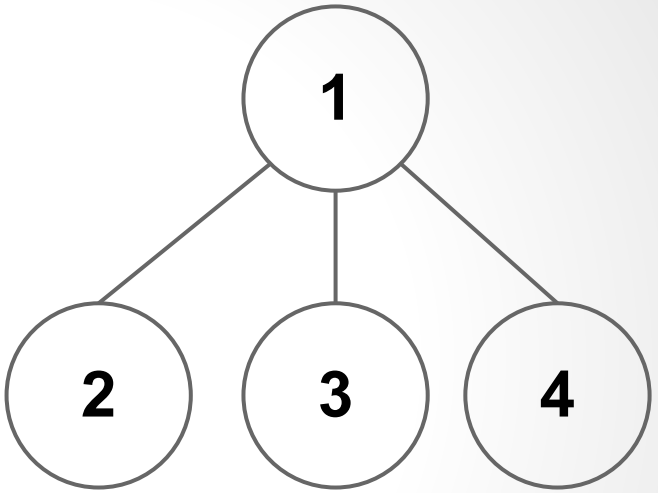
Loop: not goal, generate children



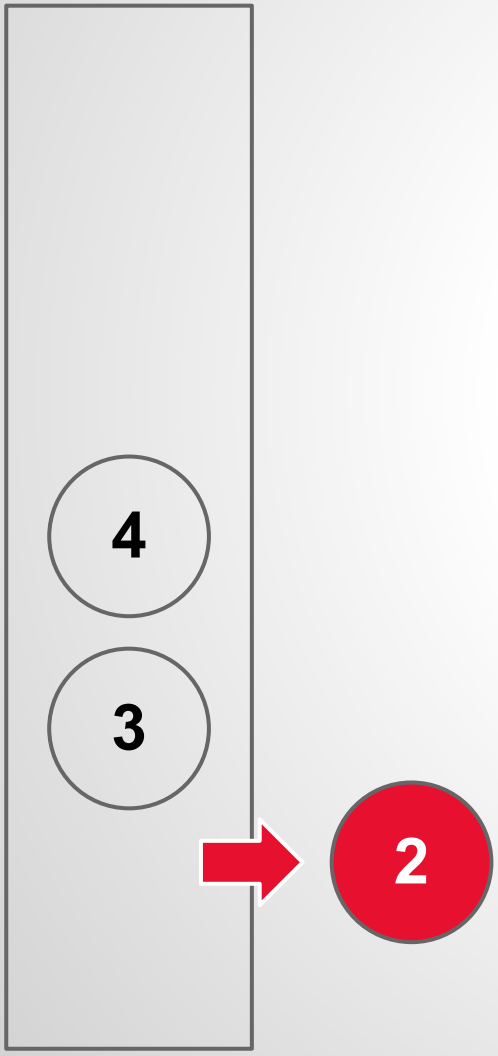
Loop: append children to fringe

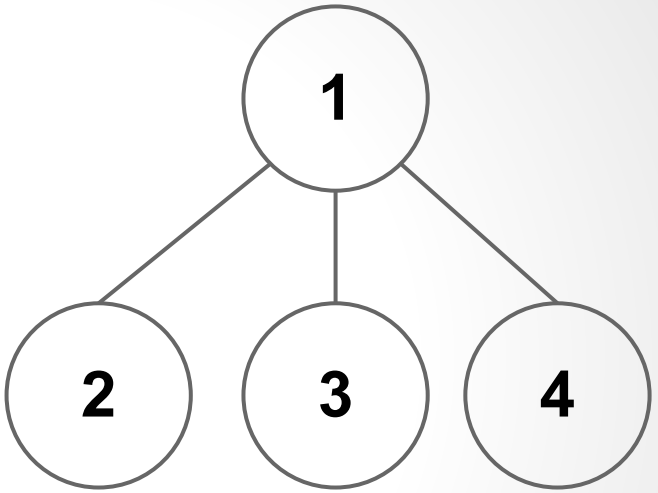


Loop: new iteration

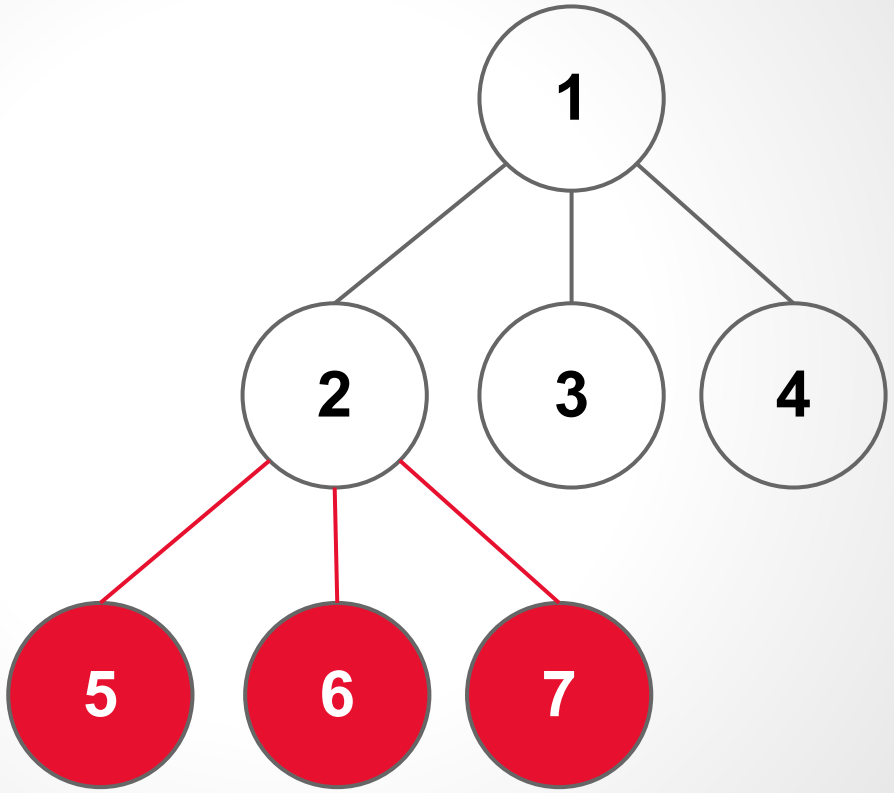


Loop: pop node from fringe

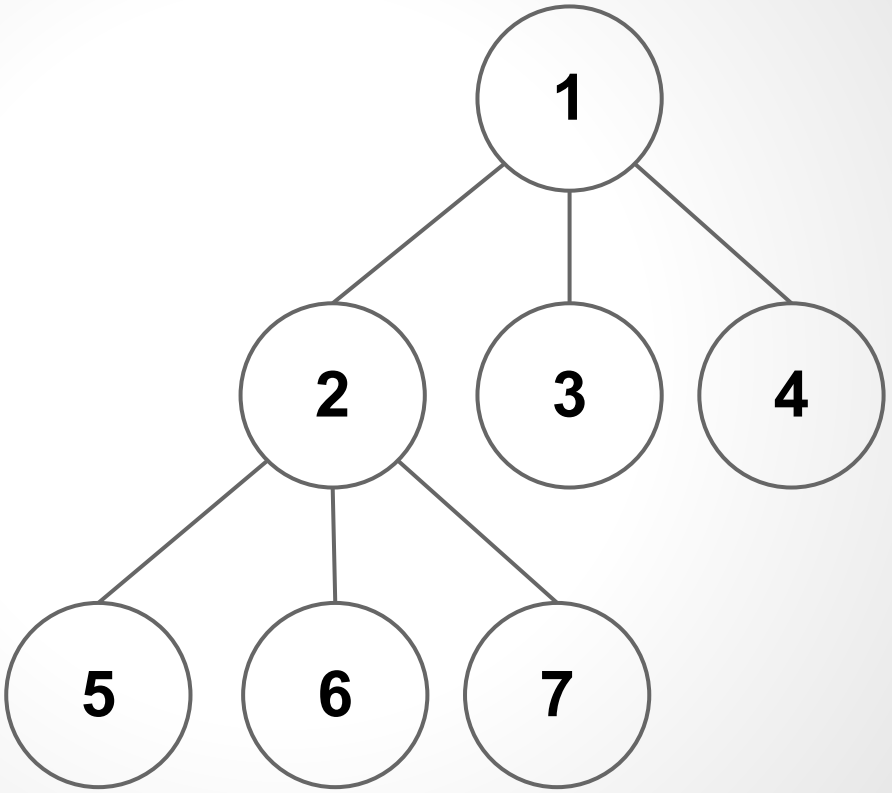




Loop: not goal, append children



Loop: new iteration



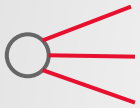
Implementation using SimpleAI

Implementation using SimpleAI

class SearchProblem:

Implementation using SimpleAI

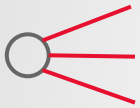
class SearchProblem:



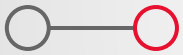
actions(state)

Implementation using SimpleAI

class SearchProblem:



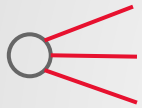
actions(state)



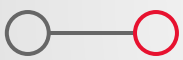
result(state, action)

Implementation using SimpleAI

class SearchProblem:



actions(state)

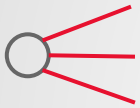


result(state, action)

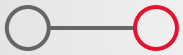
cost(state1, action, state2)

Implementation using SimpleAI

class SearchProblem:



actions(state)



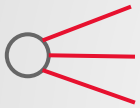
result(state, action)

cost(state1, action, state2)

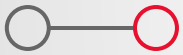
heuristic(state)

Implementation using SimpleAI

class SearchProblem:



actions(state)



result(state, action)

cost(state1, action, state2)

heuristic(state)

is_goal(state)

Conclusions

Conclusions

- easy to use

Conclusions

- easy to use
- broad field of application

Conclusions

- easy to use
- broad field of application
- graphical debuggers are really useful

More info

- AIMA book:
  http://aima.cs.berkeley.edu/
- SimpleAI docs:
  http://simpleai.readthedocs.org
- SimpleAI discussion:
  http://groups.google.com/group/simpleai
- This talk and the 8-puzzle example:
  https://github.com/fisadev/talks
  (simpleai-intro)
- Can I help?
  fisadev@gmail.com / @fisadev

?

questions