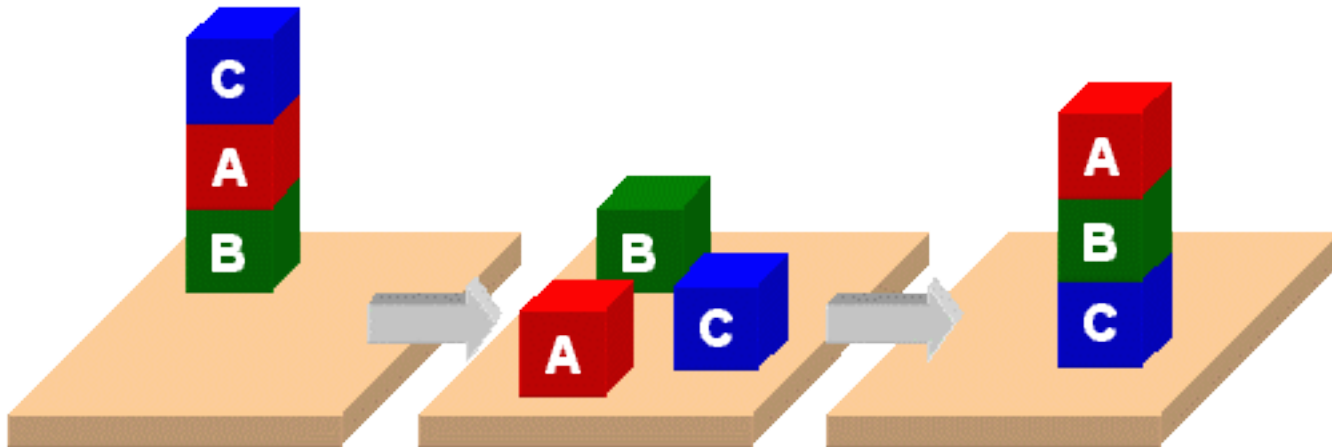
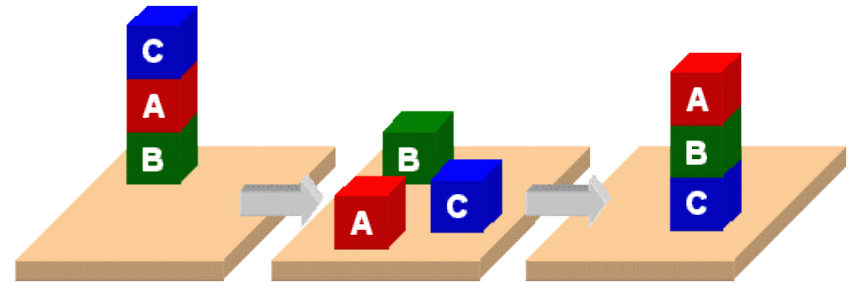


PDDL



PDDL



- Planning Domain Description Language
- Based on STRIPS with various extensions
- First defined by Drew McDermott (Yale) et al.
 - Classic spec: [PDDL 1.2](#); good [reference guide](#)
- Used in biennial [International Planning Competition](#) (IPC) series (1998-2020)
- Many planners use it as a standard input

PDDL Representation

- Task specified via two files: **domain file** and **problem file**
 - Both use a logic-oriented notation with Lisp syntax
- **Domain file** defines a domain via *requirements*, *predicates*, *constants*, and *actions*
 - Used for many different problem files
- **Problem file**: defines problem by describing its *domain*, *objects*, *initial state* and *goal state*
- **Planner**: takes a domain and a problem and produces a plan

Blocks Word Domain File



(define (domain BW)

(:requirements :strips)

(:constants red green blue yellow small large)

(:predicates (on ?x ?y) (on-table ?x) (color ?x ?y) ... (clear ?x))

(:action pick-up

 :parameters (?obj1)

 :precondition (and (clear ?obj1) (on-table ?obj1)
 (arm-empty))

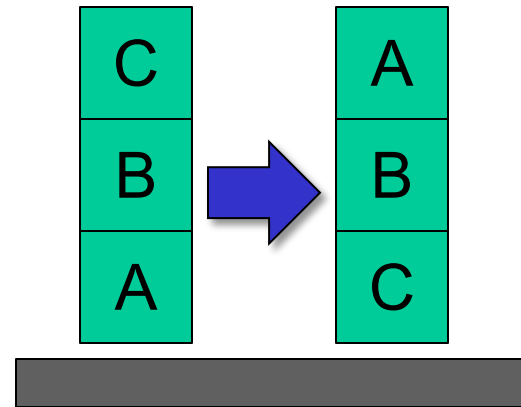
 :effect (and (not (on-table ?obj1))
 (not (clear ?obj1))
 (not (arm-empty))
 (holding ?obj1)))

... more actions ...)

Blocks World Problem File



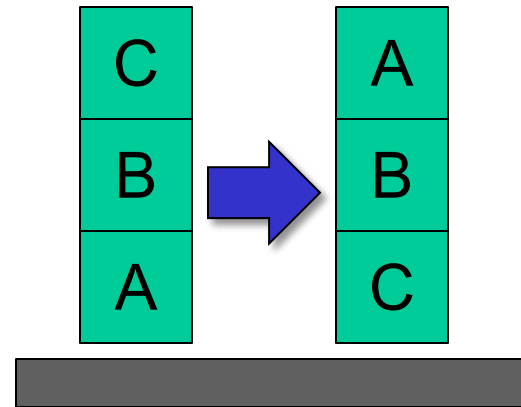
```
(define (problem 00)
  (:domain BW)
  (:objects A B C)
  (:init (arm-empty)
         (on B A)
         (on C B)
         (clear C))
  (:goal (and (on A B)
              (on B C))))
```



Blocks World Problem File

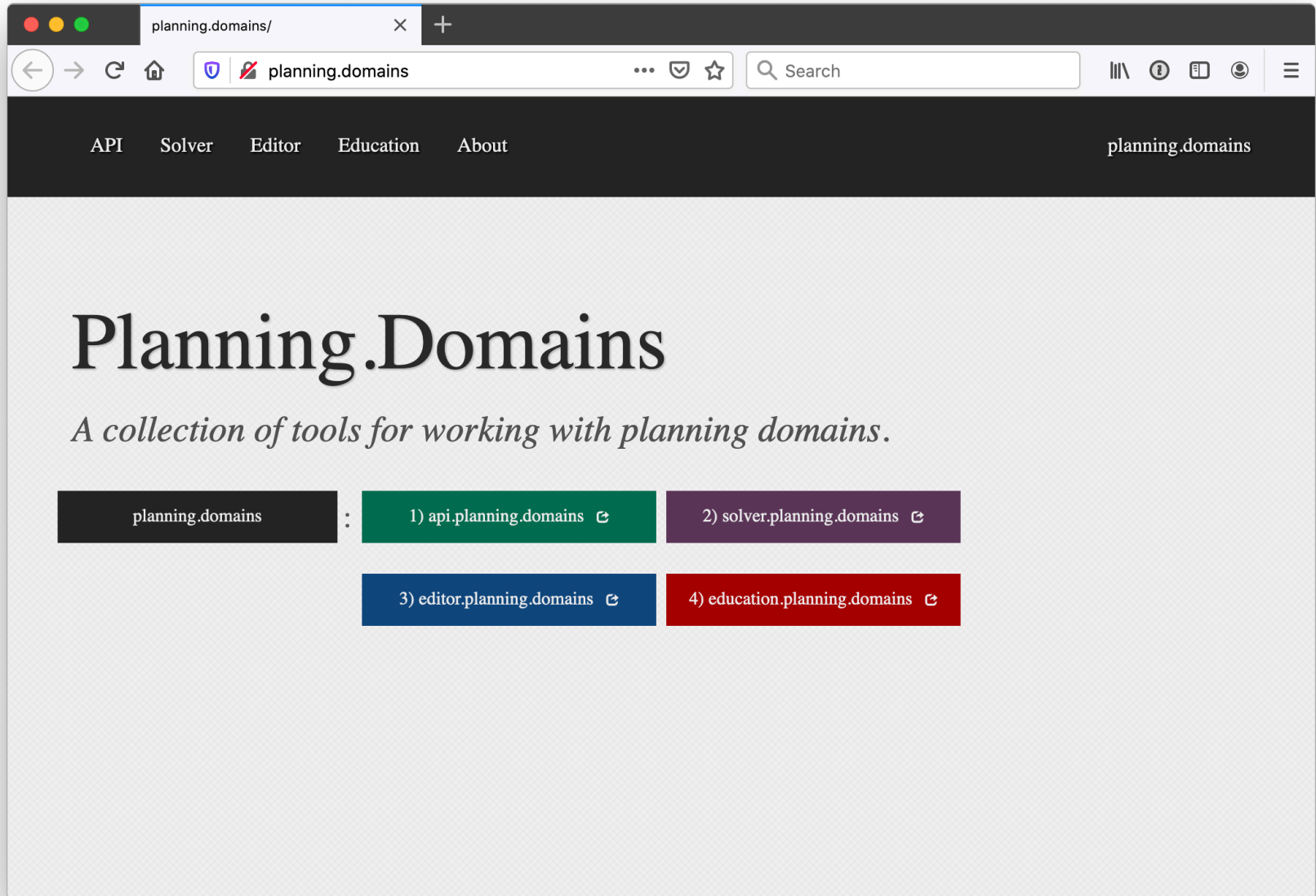


```
(define (problem 00)
  (:domain BW)
  (:objects A B C)
  (:init (arm-empty)
         (on B A)
         (on C B)
         (clear C))
  (:goal (and (on A B)
              (on B C))))
```



```
Begin plan
1 (unstack c b)
2 (put-down c)
3 (unstack b a)
4 (stack b c)
5 (pick-up a)
6 (stack a b)
End plan
```

http://planning.domains/



Planning.domains

- Open source environment for providing planning services using PDDL ([GitHub](#))
- Default planner is [ff](#)
 - very successful forward-chaining heuristic search planner producing sequential plans
 - Can be configured to work with other planners
- Use interactively or call via web-based API
- Use for HW5 to extend blocks world domain

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