

PDDL

□ Domain definition. Operators.

```
(:action take-out
  :parameters (?x - physob)
  :precondition (not (= ?x B))
  :effect (not (in ?x B)) )
```

```
(:action Mov-B
  :parameters (?m ?l - location)
  :precondition (and (at B ?m) (not (= ?m ?l)))
  :effect (and (at B ?l) (not (at B ?m))
    (forall (?z)
      (when (and (in ?z B) (not (= ?z B)))
        (and (at ?z ?l) (not (at ?z ?m))))))) )
```

```
(:action put-in
  :parameters (?x - physob ?l - location)
  :precondition (not (= ?x B))
  :effect (when (and (at ?x ?l) (at B ?l))
    (in ?x B) ) )
```

PDDL

□ Problem definition

```
(define (problem get-paid)  
  (:domain briefcase-world)  
  (:objects P D - physob  home office - location )  
  (:init (at B home) (at P home) (at D home) (in P B))  
  (:goal (and (at B office) (at D office) (at P home))))
```

PDDL: example

- Model in PDDL the blocks world domain
- There are 4 operators:
 - Stack
 - Unstack
 - Pick-up
 - Put-down

PDDL: example

- UNSTACK(x; y)
 - preconditions: encima(x; y), libre(x), brazo-libre
 - add: sujeto(x), libre(y)
 - del: encima(x; y), brazo-libre, libre(x)
- STACK(x; y)
 - preconditions: sujeto(x), libre(y)
 - add: encima(x; y), libre(x), brazo-libre
 - del: sujeto(x), libre(y)
- PUT-DOWN(x)
 - preconditions: sujeto(x)
 - add: en-mesa(x), libre(x), brazo-libre
 - del: sujeto(x)
- PICK-UP(x)
 - preconditions: en-mesa(x), libre(x), brazo-libre
 - add: sujeto(x)
 - del: en-mesa(x), brazo-libre, libre(x)

Some Planners available

☐ Planners

■ **SGPlan**

<https://wah.cse.cuhk.edu.hk/wah/programs/SGPlan/>

■ **LAMA**

<https://github.com/rock-planning/planning-lama>

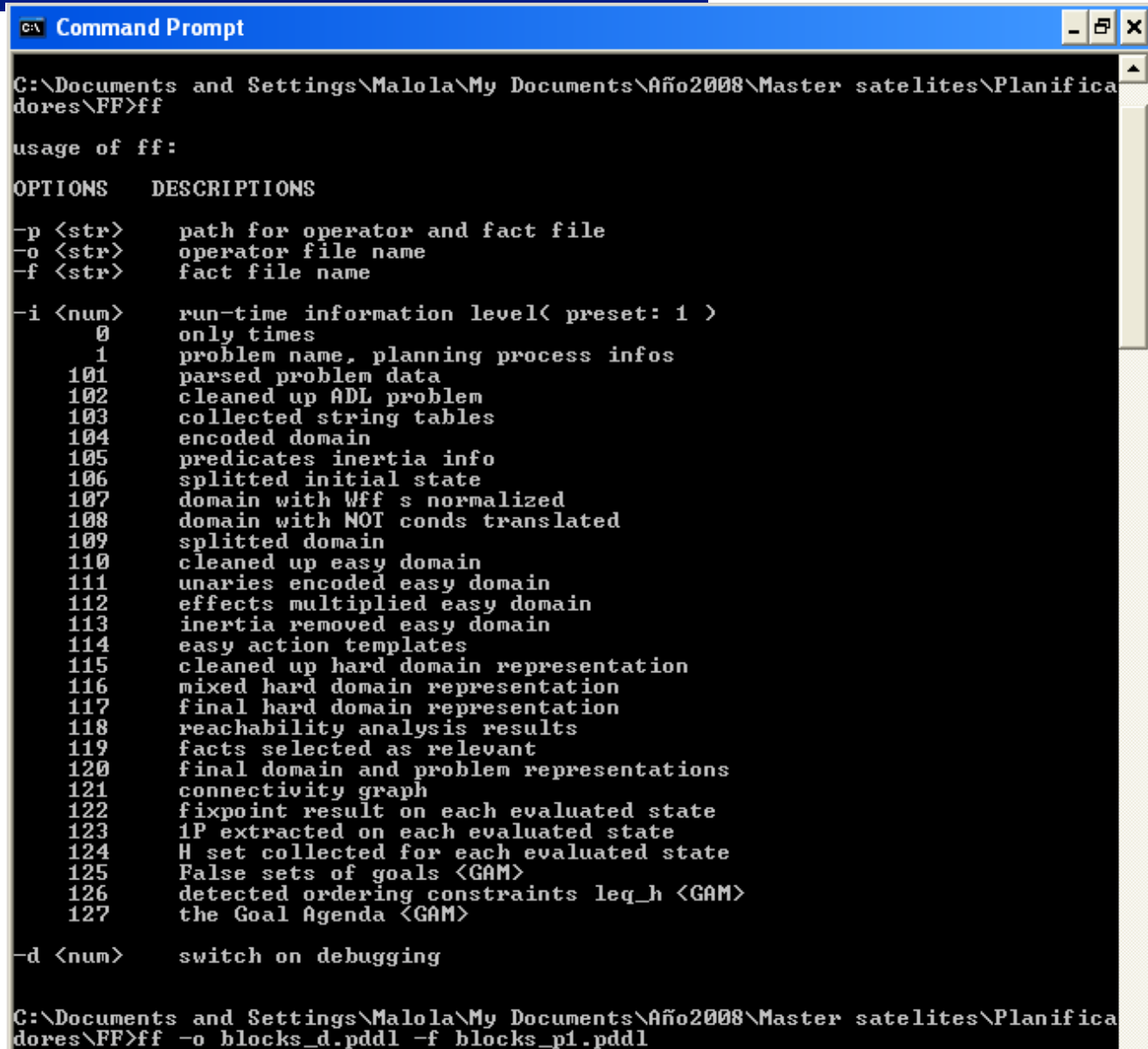
■ **International Planning Competition (IPS)**

<http://icaps-conference.org/index.php/main/competitions>

☐ Editor on Line

<http://editor.planning.domains>

Execute FF (Windows)



```
C:\> Command Prompt

G:\Documents and Settings\Malola\My Documents\Año2008\Master satelites\Planifica
dores\FF>ff

usage of ff:

OPTIONS   DESCRIPTIONS

-p <str>   path for operator and fact file
-o <str>   operator file name
-f <str>   fact file name

-i <num>   run-time information level< preset: 1 >
          0   only times
          1   problem name, planning process infos
          101  parsed problem data
          102  cleaned up ADL problem
          103  collected string tables
          104  encoded domain
          105  predicates inertia info
          106  splitted initial state
          107  domain with Wff s normalized
          108  domain with NOT conds translated
          109  splitted domain
          110  cleaned up easy domain
          111  unaries encoded easy domain
          112  effects multiplied easy domain
          113  inertia removed easy domain
          114  easy action templates
          115  cleaned up hard domain representation
          116  mixed hard domain representation
          117  final hard domain representation
          118  reachability analysis results
          119  facts selected as relevant
          120  final domain and problem representations
          121  connectivity graph
          122  fixpoint result on each evaluated state
          123  1P extracted on each evaluated state
          124  H set collected for each evaluated state
          125  False sets of goals <GAM>
          126  detected ordering constraints leq_h <GAM>
          127  the Goal Agenda <GAM>

-d <num>   switch on debugging

G:\Documents and Settings\Malola\My Documents\Año2008\Master satelites\Planifica
dores\FF>ff -o blocks_d.pddl -f blocks_p1.pddl
```

Execute SGPlan (Linux)

```
viki@c3po: ~/Documents
viki@c3po:~/Documents$ ./sgplan522
#
# Copyright (C) 2006, Board of Trustees of the University of Illinois.
#
# The program is copyrighted by the University of Illinois, and should
# not be distributed without prior approval. Commercialization of this
# product requires prior licensing from the University of Illinois.
# Commercialization includes the integration of this code in part or
# whole into a product for resale.
#
#-----
# Author: C. W. Hsu, B. W. Wah, R. Y. Huang, Y. X. Chen
#-----

SGPlan-5 settings:
-o <string>           specifies the file of the operators
-f <string>           specifies the file of (init/goal) facts
-out <string>         specifies the file name for computed plans, standard output if not specified
-cputime <number>    specifies the maximum CPU-time (in seconds)

viki@c3po:~/Documents$ ./sgplan522 -o blocksWorld.pddl -f blocks1.pddl
```