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FIRST HOMEWORK

A* search:
we have studied the documents:
- *"documentation.txt"* in "doc" folder
- *"README.rst"* in the root directory

and we finded out that we can do an a* search by adding *"-s {wanted heuristic search algorithm}"*

```
py ./src/pyperplan.py -help
```

```
usage: pyperplan.py [-h] [-l {debug,info,warning,error}]
                    [-H {hsa,landmark,hmax,blind,hadd,lmcut,hff}]
                    [-s {gbf,sat,wastar,astar,ehs,ids,bfs}]
                    [domain] problem
```

(Example)

```
./src/pyperplan.py -s astar benchmarks/blocks/domain.pddl
benchmarks/blocks/task01.pddl
```

SECOND HOMEWORK

DOMAIN.PDDL MODIFICATIONS
First of all we have defined the predicate *"(onconveyor ?x - block)"*, cause conveyor was not defined and obviously we couldnt put blocks on it.
Secondly we added an "effect" in "action pick-up" *[(not (onconveyor ?x))]* that specifies if the block is on conveyor or not
Lastly we defined the action "put-conveyor" that moves the desidered block on conveyor

here's the code:

```
 (:action put-conveyor
         :parameters (?x - block)
         :precondition (holding ?x)
         :effect
         (and (not (holding ?x))
            (not (clear ?x))
            (handempty)
            (onconveyor ?x)))
```

The action has almost the same behavior of the action "put-down" but we added *(not (clear ?x))* option cause we don't want that the system can pick-up the blocks on the conveyor, so doing that we block a pick-up prerequisite making the block "disappear" for the system.

TASK01.PDDL MODIFICATIONS

We have modified *task01.pddl* too, cause we have to change our goal and our initial state.
We added an "E" block in the initial state and the onconveyor statement in the goal for block B and D.

```
(:objects D B A C E - block)
```

we changed our init state, cause the init situatios must be:

```
E
D
C
B
A
```

```
(:INIT (CLEAR E) (ONTABLE A) (ON E D) (ON D C) (ON C B) (ON B A)
(HANDEMPTY))
```

and finally we modified our goal to reach:

```
E
C       D   B
A
```

```
(:goal (AND (ONCONVEYOR D) (ONCONVEYOR B) (ON E C) (ON C A) ))
```

RESULT:
We get a *.soln* file that represent the correct combination of the blocks:

```
(unstack e d)
(put-down e)
(unstack d c)
(put-conveyor d)
(unstack c b)
(put-down c)
(unstack b a)
(put-conveyor b)
(pick-up c)
(stack c a)
(pick-up e)
(stack e c)
```

Regards.