



## Homework / Project Document

Course	<b>Planning and Scheduling</b>
Homework/ Project	<b>#2</b>
Title	<b>UCPOP Input/Output</b>
Students/ Authors	<b>Alexander Moriarty and Alexander Hagg</b>

Instructor	Prof. Gerhard Kraetzschmar
Project Evaluator	Prof. Gerhard Kraetzschmar
Acceptance Status	<input type="checkbox"/> Accepted <input type="checkbox"/> Revision needed <input type="checkbox"/> Rejected
Points	
Comments:	

File: shopping.lisp output to html with vi:TOhtml

```

;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
;;; Shopping problem using UCPOP
;;; Author: Alex Moriarty & Alex Hagg
;;; Course: Planning & Scheduling
;;; Due: Tuesday, 29 October 2013, 1900h

;; Load the required libraries and change package
;; This prints a bunch of crap which we send to /dev/null

(defparameter *ucpop-root-dir* (string "~/src/ucpop/"))

(with-open-file (*standard-output* "/dev/null" :direction :output
               :if-exists :supersede)
  (load (concatenate 'string *ucpop-root-dir* "loader"))
  (load-ucpop)
  (in-package ucpop))

(define (domain shopping-domain)

;; Go from location l to m
  (:operator GO
   :parameters (?l ?m)
   :precondition (at shopper ?l)
   :effect (:and (at shopper ?m) (:not (at shopper ?l))))

;; Buy product p from shop s
  (:operator BUY
   :parameters (?p ?s)
   :precondition (:and (at shopper ?s) (sells ?s ?p))
   :effect (has shopper ?p))

(define (problem shopping-example)
  :domain 'shopping-domain
  :inits ((location home)(location hardware-store)
          (location super-market)
          (at shopper home)(at drill hardware-store)
          (at milk super-market)(at banana super-market)
          (sells hardware-store drill)(sells super-market milk)
          (sells super-market banana))
  :goal (:and (has shopper drill)(has shopper milk)
            (has shopper banana)(at shopper home)))

(bf-control 'shopping-example)

```

Generated with:

```
$ clisp shopping > shopping.output
$ vi shopping.lisp :TOhtml
```

Initial :

```
((LOCATION HOME) (LOCATION HARDWARE-STORE) (LOCATION SUPER-MARKET)
 (AT SHOPPER HOME) (AT DRILL HARDWARE-STORE) (AT MILK SUPER-MARKET)
 (AT BANANA SUPER-MARKET) (SELLS HARDWARE-STORE DRILL)
 (SELLS SUPER-MARKET MILK) (SELLS SUPER-MARKET BANANA))
```

```
Step 1 : (GO HOME SUPER-MARKET) Created 3
0 -> (AT SHOPPER HOME)
Step 2 : (BUY BANANA SUPER-MARKET) Created 5
0 -> (SELLS SUPER-MARKET BANANA)
3 -> (AT SHOPPER SUPER-MARKET)
Step 3 : (BUY MILK SUPER-MARKET) Created 4
0 -> (SELLS SUPER-MARKET MILK)
3 -> (AT SHOPPER SUPER-MARKET)
Step 4 : (GO SUPER-MARKET HARDWARE-STORE) Created 2
3 -> (AT SHOPPER SUPER-MARKET)
Step 5 : (BUY DRILL HARDWARE-STORE) Created 1
0 -> (SELLS HARDWARE-STORE DRILL)
2 -> (AT SHOPPER HARDWARE-STORE)
Step 6 : (GO HARDWARE-STORE HOME) Created 6
2 -> (AT SHOPPER HARDWARE-STORE)
```

Goal :

```
(AND (HAS SHOPPER DRILL) (HAS SHOPPER MILK) (HAS SHOPPER BANANA)
 (AT SHOPPER HOME))
6 -> (AT SHOPPER HOME)
5 -> (HAS SHOPPER BANANA)
4 -> (HAS SHOPPER MILK)
1 -> (HAS SHOPPER DRILL)
```

Facts:

Complete!

```
UCPOP Stats: Initial terms = 10; Goals = 5 ; Success (6 steps)
Created 402 plans, but explored only 250
CPU time: 0.7345 sec
Branching factor: 1.244
Working Unifies: 2800
Bindings Added: 203
```