

Project Task 4: Establish Single Random Move

By Carrie Corcoran

This is the fourth task for my semester-long project of creating heuristic Mancala players. It entails functions to generate a single random move.

Code:

```
;-----Creates list of spaces with
stones in them
(defun non-empty-spaces (player start spaces)
  (cond
    ((eql player 'a)
     (setf side *side-A*)
     )
    (t
     (setf side *side-B*)
     )
  )
  (cond
    ((= start 5)
     (cond
       ((= (get (nth 5 side) 'value) 0)
        spaces
       )
       (t
        (cons (nth 5 side) spaces)
       )
     )
    )
    (t
     (cond
       ((= (get (nth start side) 'value) 0)
        (non-empty-spaces player (+ start 1) spaces)
       )
       (t
        (non-empty-spaces player (+ start 1) (cons (nth start side)
spaces)))
       )
     )
  )
)

;-----Runs single random move
(defun random-move (player)
  (setf potential-moves (non-empty-spaces player 0 '()))
  (setf random-num (random (length potential-moves)))
```

```

(setf random-move (nth random-num potential-moves))
(format t "Random player picks up stones in ~A ~%" random-move)
(setf again (single-move player random-move))
(cond
  (again
    (format t "Random player moves again! ~%")
    (random-move player)
  )
)
)
)

```

Demo:

```

[1]> (load "mancala.l")
;; Loading file mancala.l ...
;; Loaded file mancala.l
T
[2]> (non-empty-spaces 'a 0 '())
(A6 A5 A4 A3 A2 A1)
[3]> (non-empty-spaces 'b 0 '())
(B1 B2 B3 B4 B5 B6)
[4]> (draw-board)

```

HB	B6	B5	B4	B3	B2	B1	
—	4	4	4	4	4	4	—
0	—	—	—	—	—	—	
	—	—	—	—	—	—	0
	4	4	4	4	4	4	
—	—	—	—	—	—	—	—
	A1	A2	A3	A4	A5	A6	HA

```

NIL
[5]> (random-move 'a)
Random player picks up stones in A1

```

HB	B6	B5	B4	B3	B2	B1	
—	4	4	4	4	4	4	—
0	—	—	—	—	—	—	
	—	—	—	—	—	—	0
	0	5	5	5	5	4	
—	—	—	—	—	—	—	—
	A1	A2	A3	A4	A5	A6	HA

```

Picking up stones in A5

```

HB	B6	B5	B4	B3	B2	B1	
—	4	4	4	5	5	5	—
0	—	—	—	—	—	—	
	—	—	—	—	—	—	1
	0	5	5	5	0	5	
—	—	—	—	—	—	—	—
	A1	A2	A3	A4	A5	A6	HA

Picking up stones in B3

HB	B6	B5	B4	B3	B2	B1	
—	5	5	5	0	5	5	—
0	—	—	—	—	—	—	
	—	—	—	—	—	—	1
	1	6	5	5	0	5	
—	—	—	—	—	—	—	—
	A1	A2	A3	A4	A5	A6	HA

Picking up stones in A2

HB	B6	B5	B4	B3	B2	B1	
—	5	5	5	0	5	6	—
0	—	—	—	—	—	—	
	—	—	—	—	—	—	2
	1	0	6	6	1	6	
—	—	—	—	—	—	—	—
	A1	A2	A3	A4	A5	A6	HA

Picking up stones in B1

HB	B6	B5	B4	B3	B2	B1	
—	6	6	6	1	6	0	—
0	—	—	—	—	—	—	
	—	—	—	—	—	—	2
	2	0	6	6	1	6	
—	—	—	—	—	—	—	—
	A1	A2	A3	A4	A5	A6	HA

Picking up stones in A1

HB	B6	B5	B4	B3	B2	B1	
—	6	6	6	1	6	0	—
0	—	—	—	—	—	—	—
—	—	—	—	—	—	—	2
—	0	1	7	6	1	6	—
—	—	—	—	—	—	—	—
—	A1	A2	A3	A4	A5	A6	HA

Picking up stones in A3

HB	B6	B5	B4	B3	B2	B1	
—	6	6	6	2	7	1	—
0	—	—	—	—	—	—	—
—	—	—	—	—	—	—	3
—	0	1	0	7	2	7	—
—	—	—	—	—	—	—	—
—	A1	A2	A3	A4	A5	A6	HA

Picking up stones in B3

HB	B6	B5	B4	B3	B2	B1	
—	6	7	7	0	7	1	—
0	—	—	—	—	—	—	—
—	—	—	—	—	—	—	3
—	0	1	0	7	2	7	—
—	—	—	—	—	—	—	—
—	A1	A2	A3	A4	A5	A6	HA

Picking up stones in B5

HB	B6	B5	B4	B3	B2	B1	
—	7	0	7	0	7	1	—
0	—	—	—	—	—	—	—
—	—	—	—	—	—	—	3
—	1	2	1	8	3	8	—
—	—	—	—	—	—	—	—
—	A1	A2	A3	A4	A5	A6	HA

Picking up stones in A6

HB	B6	B5	B4	B3	B2	B1	
—	8	1	8	1	8	2	—
0	—	—	—	—	—	—	—
—	—	—	—	—	—	—	4
—	2	2	1	8	3	0	—
—	—	—	—	—	—	—	—
—	A1	A2	A3	A4	A5	A6	HA

Picking up stones in A1

HB	B6	B5	B4	B3	B2	B1	
—	8	1	8	1	8	2	—
0	—	—	—	—	—	—	—
—	—	—	—	—	—	—	4
—	0	3	2	8	3	0	—
—	—	—	—	—	—	—	—
—	A1	A2	A3	A4	A5	A6	HA

Picking up stones in A3

HB	B6	B5	B4	B3	B2	B1	
—	8	1	8	1	8	2	—
0	—	—	—	—	—	—	—
—	—	—	—	—	—	—	4
—	0	3	0	9	4	0	—
—	—	—	—	—	—	—	—
—	A1	A2	A3	A4	A5	A6	HA

Picking up stones in A5

HB	B6	B5	B4	B3	B2	B1	
—	8	1	8	1	9	3	—
0	—	—	—	—	—	—	—
—	—	—	—	—	—	—	5
—	0	3	0	9	0	1	—
—	—	—	—	—	—	—	—
—	A1	A2	A3	A4	A5	A6	HA

Picking up stones in B2

HB	B6	B5	B4	B3	B2	B1	
—	9	2	9	2	0	3	—
0	—	—	—	—	—	—	—
—	—	—	—	—	—	—	5
—	1	4	1	10	1	1	—
—	—	—	—	—	—	—	—
—	A1	A2	A3	A4	A5	A6	HA

Player picks up stones in opposite space and places them in the player's mancala

HB	B6	B5	B4	B3	B2	B1	
—	9	2	9	2	0	3	—
0	—	—	—	—	—	—	—
—	—	—	—	—	—	—	5
—	1	4	1	10	1	1	—
—	—	—	—	—	—	—	—
—	A1	A2	A3	A4	A5	A6	HA

NIL

[6]> (random-move 'b)

Random player picks up stones in B5

HB	B6	B5	B4	B3	B2	B1	
—	10	0	9	2	0	3	—
1	—	—	—	—	—	—	—
—	—	—	—	—	—	—	5
—	1	4	1	10	1	1	—
—	—	—	—	—	—	—	—
—	A1	A2	A3	A4	A5	A6	HA

Last stone placed in player's mancala

Random player moves again!

Random player picks up stones in B6

	HB	B6	B5	B4	B3	B2	B1	
	—	—	—	—	—	—	—	
		0	0	9	3	1	4	
	2	—	—	—	—	—	—	
		—	—	—	—	—	—	
		2	5	2	11	2	2	
	—	—	—	—	—	—	—	
		A1	A2	A3	A4	A5	A6	HA

Picking up stones in B3

	HB	B6	B5	B4	B3	B2	B1	
	—	—	—	—	—	—	—	
		1	1	10	0	1	4	
	2	—	—	—	—	—	—	
		—	—	—	—	—	—	
		2	5	2	11	2	2	
	—	—	—	—	—	—	—	
		A1	A2	A3	A4	A5	A6	HA

Player picks up stones in opposite space and places them in the player's mancala

	HB	B6	B5	B4	B3	B2	B1	
	—	—	—	—	—	—	—	
		1	1	10	0	1	4	
	4	—	—	—	—	—	—	
		—	—	—	—	—	—	
		0	5	2	11	2	2	
	—	—	—	—	—	—	—	
		A1	A2	A3	A4	A5	A6	HA

NIL

```
[7]> (non-empty-spaces 'a 0 '())
(A6 A5 A4 A3 A2)
[8]> (non-empty-spaces 'b 0 '())
(B1 B2 B4 B5 B6)
```