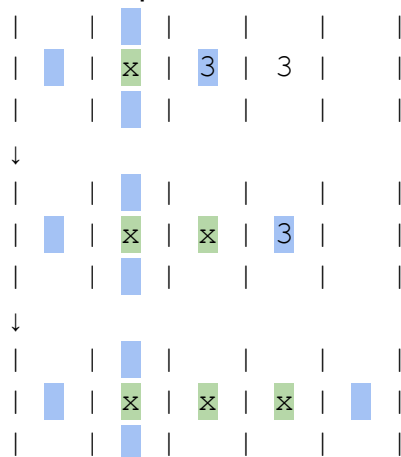


Random Player Plus Plus

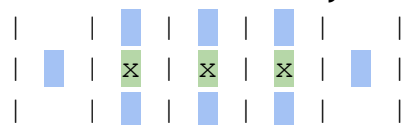
Abstract

This player is an “improved” version of “RandomPlayerPlus”, with “improvement” being that it will try to infer a ship’s position after achieving consecutive hits, resulting in a quicker sinking of enemy ships.

For example:



This on theory should allow the AI to move on to other locations after sinking a ship, instead of Random Player Plus’s version in the same situation:



Code

Everything is the same, except the modify list function

```
(defmethod modifyLists((l location) hit (p randomPlayerPlusPlus) &aux
unexplored explored preferred board adjacent)
  ; Get the player's lists in place
  (setf unexplored (player-unexplored p))
  (setf explored (player-explored p))
  (setf preferred (player-preferred p))
```

```

; Remove the current location from the (unexplored / preferred) list,
and add it to explored
(setf unexplored (remove l unexplored))
(setf preferred (remove l preferred))
(setf explored (cons l explored))

; Note:
;   only from the explored list elements will be checked for
consecutive hits.
;   only the unexplored list elements will be moved to preferred list.
;   the ? mark represent the location that will be moved to the
preferred list if not nil.
(setf board (player-otherBoard p))
(cond
  ; | x | x | ? |
  ((and (isLocationHit (getLeftAdjacent l explored) board) hit)
    (setf adjacent (getRightAdjacent l unexplored))
  )
  ; | ? | x | x |
  ((and (isLocationHit (getRightAdjacent l explored) board) hit)
    (setf adjacent (getLeftAdjacent l unexplored))
  )
  ; x
  ; x
  ; ?
  ((and (isLocationHit (getAboveAdjacent l explored) board) hit)
    (setf adjacent (getBelowAdjacent l unexplored))
  )
  ; ?
  ; x
  ; x
  ((and (isLocationHit (getBelowAdjacent l explored) board) hit)
    (setf adjacent (getAboveAdjacent l unexplored))
  )
  ; |   | ? |   |
  ; | ? | x | ? |
  ; |   | ? |   |
  (hit
    (setf adjacent nil)
  )

```

```

        (setf preferred (append (getAdjacents l unexplored)
preferred))
    )
)
(if (not (equal adjacent nil))
    (setf preferred (cons adjacent preferred))
)

; Write back the modified values
(setf (player-unexplored p) unexplored)
(setf (player-explored p) explored)
(setf (player-preferred p) preferred)

nil
)

```

Demo

I have highlighted AI's shots in green.

	A	B	C	D	E	F	G	H	I	J		A	B	C	D	E	F	G	H	I	J
0			o	o	x	x						0									
1				o								1		5	5	5	5	5			
2												2								o	
3												3			4	4	4	4			
4												4									
5												5				3	x	3			
6												6		o	o						
7												7		2			o				
8												8		2					1	1	
9												9		2							

Enemy fired at F, 5
Enter target location: f 0
You sunk a SUBMARINE.

Your markers and your board:

	A	B	C	D	E	F	G	H	I	J
0			o	o	x	x	x			
1				o						
2										
3										
4										
5										
6										
7										
8										
9										

Enemy fired at F, 4
Enter target location: h 0
It missed.

	A	B	C	D	E	F	G	H	I	J
0										
1		5	5	5	5	5				
2										o
3			4	4	4	4				
4						o				
5					3	x	3			
6		o	o							
7		2			o					
8		2						1	1	
9		2								

Your markers and your board:

	A	B	C	D	E	F	G	H	I	J
0			o	o	x	x	x		o	
1				o						
2										
3										
4										
5										
6										
7										
8										

	A	B	C	D	E	F	G	H	I	J
0										
1		5	5	5	5	5				
2										o
3			4	4	4	4				
4						o				
5					3	x	x			
6		o	o							
7		2			o					
8		2						1	1	

9 | | 2 | | | | | | | | | |

	A	B	C	D	E	F	G	H	I	J
0										
1		5	5	5	5	5				
2										o
3			4	4	4	4				
4						o				
5					3	x	x	o		
6		o	o							
7		2			o					
8		2						1	1	
9		2								

	A	B	C	D	E	F	G	H	I	J
0										
1		5	5	5	5	5				
2										o
3			4	4	4	4				
4						o				
5					3	x	x	o		

```
Enemy fired at F, 6
Enter target location: g 1
It missed.
```

Your markers and your board:

```
Enemy fired at E, 5
Enter target location: i 1
It's a hit!
```

Your markers and your board:

[illegible]

Your markers and your board:

	A	B	C	D	E	F	G	H	I	J
0			o	o	x	x	x		o	o
1	o			o			o	x	x	
2									x	
3									o	
4										
5										
6										
7										
8										
9										

Enemy fired at B, 0

Enter target location: j 1

You sunk a CRUISER.

Your markers and your board:

	A	B	C	D	E	F	G	H	I	J
0			o	o	x	x	x		o	o
1	o			o			o	x	x	x
2									x	
3									o	
4										
5										
6										
7										
8										

	A	B	C	D	E	F	G	H	I	J
0		o								
1	o	x	5	5	5	5				
2		o								o
3			4	4	4	4				
4						o				
5				o	x	x	x	o		
6		o	o			o				
7		2			o					
8		2						1	1	
9		2								

	A	B	C	D	E	F	G	H	I	J
0		o								
1	o	x	x	5	5	5				
2		o								o
3			4	4	4	4				
4						o				
5				o	x	x	x	o		
6		o	o			o				
7		2			o					
8		2						1	1	

```
+---+---+---+---+---+---+---+---+---+
9 | | | | | | | | | | |
+---+---+---+---+---+---+---+---+---+
```

Enemy fired at C, 1
Enter target location: j 2
It missed.

Your markers and your board:

```
  A B C D E F G H I J
+---+---+---+---+---+---+---+---+---+
0 | | o | o | x | x | x | | o | o | o |
+---+---+---+---+---+---+---+---+---+
1 | o | | | o | | | o | x | x | x |
+---+---+---+---+---+---+---+---+---+
2 | | | | | | | | | x | o |
+---+---+---+---+---+---+---+---+---+
3 | | | | | | | | | o | |
+---+---+---+---+---+---+---+---+---+
4 | | | | | | | | | | |
+---+---+---+---+---+---+---+---+---+
5 | | | | | | | | | | |
+---+---+---+---+---+---+---+---+---+
6 | | | | | | | | | | |
+---+---+---+---+---+---+---+---+---+
7 | | | | | | | | | | |
+---+---+---+---+---+---+---+---+---+
8 | | | | | | | | | | |
+---+---+---+---+---+---+---+---+---+
9 | | | | | | | | | | |
+---+---+---+---+---+---+---+---+---+
```

Enemy fired at D, 1
Enter target location: h 2
It's a hit!

Your markers and your board:

```
  A B C D E F G H I J
+---+---+---+---+---+---+---+---+---+
0 | | o | o | x | x | x | | o | o | o |
+---+---+---+---+---+---+---+---+---+
1 | o | | | o | | | o | x | x | x |
+---+---+---+---+---+---+---+---+---+
2 | | | | | | | | x | x | o |
+---+---+---+---+---+---+---+---+---+
3 | | | | | | | | o | |
+---+---+---+---+---+---+---+---+---+
4 | | | | | | | | | | |
+---+---+---+---+---+---+---+---+---+
5 | | | | | | | | | | |
```

```
+---+---+---+---+---+---+---+---+---+
9 | 2 | | | | | | | | | |
+---+---+---+---+---+---+---+---+---+
```

```
  A B C D E F G H I J
+---+---+---+---+---+---+---+---+---+
0 | | o | | | | | | | | |
+---+---+---+---+---+---+---+---+---+
1 | o | x | x | x | 5 | 5 | | | |
+---+---+---+---+---+---+---+---+---+
2 | | o | | | | | | | o |
+---+---+---+---+---+---+---+---+---+
3 | | | 4 | 4 | 4 | 4 | | | |
+---+---+---+---+---+---+---+---+---+
4 | | | | | o | | | | |
+---+---+---+---+---+---+---+---+---+
5 | | | o | x | x | x | o | | |
+---+---+---+---+---+---+---+---+---+
6 | | o | o | | o | | | | |
+---+---+---+---+---+---+---+---+---+
7 | | 2 | | | o | | | | |
+---+---+---+---+---+---+---+---+---+
8 | | 2 | | | | | | 1 | 1 | |
+---+---+---+---+---+---+---+---+---+
9 | | 2 | | | | | | | | |
+---+---+---+---+---+---+---+---+---+
```

```
  A B C D E F G H I J
+---+---+---+---+---+---+---+---+---+
0 | | o | | | | | | | | |
+---+---+---+---+---+---+---+---+---+
1 | o | x | x | x | x | 5 | | | |
+---+---+---+---+---+---+---+---+---+
2 | | o | | | | | | | o |
+---+---+---+---+---+---+---+---+---+
3 | | | 4 | 4 | 4 | 4 | | | |
+---+---+---+---+---+---+---+---+---+
4 | | | | | o | | | | |
+---+---+---+---+---+---+---+---+---+
5 | | | o | x | x | x | o | | |
```

6										
7										
8										
9										

Enemy fired at E, 1
Enter target location: g 2
It's a hit!

Your markers and your board:

	A	B	C	D	E	F	G	H	I	J
0		o	o	x	x	x		o	o	o
1	o			o			o	x	x	x
2							x	x	x	o
3									o	
4										
5										
6										
7										
8										
9										

Enemy fired at F, 1
Enter target location: f 3
It missed.

Your markers and your board:

	A	B	C	D	E	F	G	H	I	J
0		o	o	x	x	x		o	o	o
1	o			o			o	x	x	x
2							x	x	x	o

6		o	o			o				
7		2			o					
8		2						1	1	
9		2								

	A	B	C	D	E	F	G	H	I	J
0		o								
1	o	x	x	x	x	x				
2		o								o
3			4	4	4	4				
4						o				
5				o	x	x	x	o		
6		o	o			o				
7		2			o					
8		2						1	1	
9		2								

```
Enemy fired at G, 1
Enter target location: f 2
It's a hit!
```

Your markers and your board:

Enemy fired at G, 7

We can see that the AI is able to quickly explore all my carrier's positions, and then move on to explore elsewhere. However I also want you to see that the AI had placed ships parallel to each other, this is a thing that human players avoid, but the AI don't seem to care. Keep this in mind as it might or might not come back to hunt the ++ version.

Let's see how well it do against other AIs:

```
[4]> (getStatistics)
Available AIs:
1 - RANDOMPLAYER
2 - RANDOMPLAYERPLUS
3 - RANDOMPLAYERPLUSPLUS
4 - TIERLISTPLAYER
Enter a corresponding number to choose AI 1: 1
Enter a corresponding number to choose AI 2: 3
Enter the number of iterations: 100

100 games played:
Player 1 (RANDOMPLAYER) victories: 0
Player 2 (RANDOMPLAYERPLUSPLUS) victories: 100
Draws: 0
NIL
[5]> (getStatistics)
Available AIs:
1 - RANDOMPLAYER
2 - RANDOMPLAYERPLUS
3 - RANDOMPLAYERPLUSPLUS
4 - TIERLISTPLAYER
Enter a corresponding number to choose AI 1: 2
Enter a corresponding number to choose AI 2: 3
Enter the number of iterations: 100

100 games played:
Player 1 (RANDOMPLAYERPLUS) victories: 72
Player 2 (RANDOMPLAYERPLUSPLUS) victories: 26
Draws: 2
NIL
[6]> (getStatistics)
Available AIs:
```

```
1 - RANDOMPLAYER
2 - RANDOMPLAYERPLUS
3 - RANDOMPLAYERPLUSPLUS
4 - TIERLISTPLAYER
Enter a corresponding number to choose AI 1: 2
Enter a corresponding number to choose AI 2: 3
Enter the number of iterations: 100

100 games played:
Player 1 (RANDOMPLAYERPLUS) victories: 71
Player 2 (RANDOMPLAYERPLUSPLUS) victories: 27
Draws: 2
NIL
[7]> (getStatistics)
Available AIs:
1 - RANDOMPLAYER
2 - RANDOMPLAYERPLUS
3 - RANDOMPLAYERPLUSPLUS
4 - TIERLISTPLAYER
Enter a corresponding number to choose AI 1: 3
Enter a corresponding number to choose AI 2: 3
Enter the number of iterations: 100

100 games played:
Player 1 (RANDOMPLAYERPLUSPLUS) victories: 44
Player 2 (RANDOMPLAYERPLUSPLUS) victories: 56
Draws: 0
NIL
```

I had them match a second time here, because I can't believe that the "improved" version is actually worse.

Remember that the AI doesn't care if their ships are parked right next to each other?

This could mean that:

		1		1				
				2		2		2
↓								
		1		1				
				2		2		2
↓								
		1		1				
				2		2		2
				o				

The AI does backtrack to explore other neighbors, it just assumes any consecutive hit is on a same ship.