Assignment 1 Local Search Report By Brandon Young and Ruicheng Wu

Task 1. Puzzle Representation

Processes Files 1	GUI Example	e 1:			
Basic HI Climb W Random Restarts # of iterations: 1 HII Climb w Random Restarts # of restarts Simulated Arresiling initial temperature temperature decay rate: put your iterations under basic hill climb input for simulated amending Genetic Agorithm population size: mutuating probability: puzzle size is selected on top K is 3 The tree data structure is (*10.00*,***,****(1.0)*,***(1.2)*,***(1.2)*,***(1.2)*,***(1.2)*,***(2.1)*,***,***(2.1)*,***,***(2.1)*,****(1.2.0)**] 1			Puzzle Combination		Tease
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Hill Clamb will Random Watering Probability (p): 0	Basic Hill Climb	# of iterations: 1			
Smulated Almeating Initial temperature: temperature decay rate:	Hill Climb w/ Random Restarts	# of restarts 1			
genetic Algorithm population size: mutating probability: puzzle size is selected on top K is 3 The tree data structure is: \(\frac{1}{2} \)(0.0)^*.\(\frac{1}{2} \).\(Hill Climb w/ Random Walking	probability (p): 0			
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The tree data structure is: ["(0,0)"," ","(1,0)","(0,1)"," ","(1,2)","(1,1)","(0,2)"," ","(G,G)","(2,1)"," ","(2,0)"] 1	Genetic Algorithm	population size: mutation	ng probability:		
The tree data structure is :[^10,0)^*,^* ^*,^*(1,0)^*,^*(1,1)^*,^*(1,2)^*,^*(1,1)^*,^*(0,2)^*,^*(2,1)^*,^* ^*,^*(2,0)^*]	puzzle size is selected on top				
The tree data structure is :[^10,0)^*,^* ^*,^*(1,0)^*,^*(1,1)^*,^*(1,2)^*,^*(1,1)^*,^*(0,2)^*,^*(2,1)^*,^* ^*,^*(2,0)^*]	K is 3				
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Basic Hill Climb # of iterations: 1 Hill Climb w/ Random Restarts # of restarts 1 Hill Climb w/ Random Walking probability (p): 0 Simulated Annealing initial temperature: temperature decay rate: put your iterations under basic hill climb input for simulated annealing Genetic Algorithm population size: 50 mutating probability: 0.75 puzzle size is selected on top 2 3 2 3 1 3 2 1 1 1 1 4 1 1 2 1 1 1 2 1 1		·	·	Clear Canvas	
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put your iterations under basic hill climb input for simulated annealing Genetic Algorithm population size: 50 mutating probability: 0.75 puzzle size is selected on top 2 3 2 3 1					
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2 3 2 3 1 3 2 1 1 1 4 1 1 2 1 1 1 2 1 1	puzzle size is selected on top				
3 2 1 1 1 4 1 1 2 1 1 1 2 1 1					
3 2 1 1 1 4 1 1 2 1 1 1 2 1 1					
3 2 1 1 1 4 1 1 2 1 1 1 2 1 1					
4 1 1 2 1 1 1 2 1 1					
1 1 2 1 1					
	4 1 1 2 1				
	1 1 2 1 1				
	1 1 2 1 0				

Task 2. Puzzle Evaluation

The puzzle is on the left, while the BFS output is on the right. The following shows 2 puzzles for each possible size, one that is solvable and one that is unsolvable

1.	5x5	(Solva	able)

1	1	4	1	1
1	1	2	1	1
4	1	1	2	1
1	3	1	1	1
2	1	1	1	0

o	1	2	5	5
1	2	3	5	4
2	3	4	4	3
X	4	4	5	4
5	4	3	4	5

2. 5x5 (Unsolvable):

3	4	2	1	1
3	2	1	1	1
2	3	2	1	1
4	1	2	1	2
3	2	1	2	O

О	X	2	1	2
6	4	3	2	3
4	6	3	_	4
1	5	3		2
5	5	4	5	X

3. 7x7 (Solvable):

1	3	1	4	5	3	1
6	1	1	2	1	2	2
1	4	4	3	1	1	1
1	4	1	3	2	2	1
4	4	2	3	1	1	2
6	2	1	3	1	1	1
3	1	3	2	1	1	0

0	1	7	5	2	Χ	Χ
1	5	6	4	3	4	2
6	6	7	5	4	5	4
5	2	6	4	5	3	3
6	X	7	5	4	5	4
5	7	X	4	3	4	5
7	6	7	5	4	5	5

4. 7x7 (Unsolvable):

4	1	5	4	2	1	5
1	3	1	1	3	1	1
4	3	1	1	3	3	2
6	4	3	1	1	1	1
1	2	4	1	1	2	1
6	2	2	1	3	3	4
2	1	1	1	3	2	О

0	3	2	7	1	6	2
X	4	7	6	5	5	4
Χ	3	6	5	2	5	4
2	5	4	4	5	4	3
1	2	4	3	4	5	4
2						
4	3	4	5	6	6	X

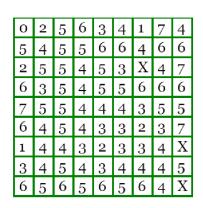
5. 9x9 (Solvable):

	5. 6116 (S6174816).								
8	1	3	7	1	3	1	5	4	
2	2	5	7	7	5	4	6	2	
5	1	4	1	6	4	1	1	3	
4	3	3	3	4	4	1	1	5	
1	3	2	3	4	4	1	5	3	
1	1	1	2	2	1	3	4	3	
8	4	6	4	1	1	1	3	5	
6	1	6	1	1	4	5	2	5	
5	6	1	4	6	5	6	1	0	

								_
О	5	4	3	2	3	X	X	1
4	5	5	6	3	\mathbf{X}	4	6	3
7	6	7	6	5	5	5	6	4
2	4	5	5	3	3	6	7	4
6	4	8	6	5	3	7	8	2
7	7	7	6	6	6	5	8	5
8	5	6	5	5	6	7	6	7
3	5	5	4	4	4	4	7	3
1	6	X	5	4	2	6	6	5

6. 9x9 (Unsolvable):

o. oxo (Choorvabic).										
6	3	1	1	4	3	5	3	4		
4	1	3	1	1	3	3	5	1		
5	6	5	1	1	2	4	5	1		
1	2	4	1	4	2	2	3	2		
5	6	6	1	2	1	3	3	3		
	3									
4	2	1	1	1	4	1	4	1		
5	1	4	3	3	1	2	3	6		
4	5	1	1	6	5	1	4	0		



7. 11x11 (Solvable):

4	9	7	7	4	1	7	10	9	9	1
3	5	5	1	6	1	7	1	2	5	9
4	5	3	1	4	1	3	2	3	7	8
1	5	6	6	7	3	4	3	1	5	5
10	1	2	5	1	6	4	1	1	1	6
10	3	5	2	2	1	2	1	5	1	7
1	5	8	7	3	5	1	1	4	1	6
3	2	1	5	3	1	4	4	1	1	7
1	2	2	7	1	3	4	1	6	1	1
1	7	6	3	5	3	6	1	7	6	6
4	7	1	5	7	4	6	1	3	5	0

o	X	5	9	1	7	7	7	2	6	7
Χ	8	9	8	7	6	7	10	11	Х	8
7	5	8	7	6	5	6	11	4	7	Χ
Χ	6	6	7	3	6	5	6	5	6	6
1	Χ	7	3	2	3	6	5	4	5	2
7	6	4	6	3	7	4	5	5	6	7
6	7	7	5	7	5	7	6	7	7	6
7	5	6	6	4	X	5	5	7	8	6
6										
5	4	6	4	8	X	5	9	3	7	8
6	5	5	6	4	4	9	8	6	5	3

8. 11x11 (Unsolvable):

				(checivacie).						
2	1	4	9	10	7	7	1	5	4	5
10	1	9	1	2	8	1	6	3	3	4
6	1	1	7	8	2	2	4	1	5	2
4	1	1	7	6	6	2	3	2	5	8
6	9	1	2	1	3	1	5	1	6	8
3	4	2	1	1	3	1	1	5	1	3
4	5	7	1	1	5	3	4	1	3	5
10	3	8	4	2	1	4	1	5	1	8
5	1	8	4	2	1	6	3	2	3	1
5	1	1	7	3	1	4	1	7	2	2
4	6	2	3	4	7	6	1	6	7	О

0	7	1	7	X	7	2	Χ	6	Χ	6
7										
1	_	_	-	_	_	_	_	_	_	-
3	_	_	_	_	_	_		_	_	_
8	3	2	3	5	4	3	4	5	6	4
4	Χ	3	5	4	5	4	5	5	7	7
6	Χ	5	4	5	5	5	5	X	6	6
4	8	4	5	5	4	3	6	6	5	4
2	7	5	X	4	3	4	6	X	6	6
7	6	6	5	5	4	5	5	6	7	6
5	7	6	5	4	5	6	6	5	7	Χ