## **Heuristic Review**

I'm using a 13' macbook pro to run this task, the heuristic I use is as followed:

Custom\_score1: (my\_moves - 2 \* my\_opp)
Custom\_score2: (my\_moves - 1 \* my\_opp)

Custom\_score3: (my\_moves - 3 \* my\_opp)

And the following two result is different with applying 150ms and 300ms time limit.

		*******	*****	****									
			g Matches										
		*****	******	****									
Match #	0pponent	AB_Improved	AB_Cust				AB_Cus						
		Won   Lost	Won I L		Won I		Won I						
1	Random	10   0	8 1	2	7 1	3	6 1	4					
2	MM_Open	7 1 3	4	6	7 1	3	6 I						
3	MM_Center	6   4	8 1	2	8	2	8 1						
4	MM_Improved	6   4 4   6	6 I 4 I	4	6 1	4	8 1	_					
5	AB_Open	4   6 5   5	4 I 6 I	6 4	7 I 5 I	3 5	6 I 7 I						
6 7	AB_Center AB_Improved	6 1 4	6 1	4	4	6	6 1	4					
									_				
	Win Rate:	62.9%	60.0%	5	62.9	9%	67.	1%					
nere wer	re 3.0 timeouts	s during the	tournamen	t n	nake si	ure you	ur agen	t han	dles s	search	timeo	ut corr	ectl
and cons	sider increasi	ng the timeou	t margin	for yo	our age	ent.							
our ager	nts forfeited a	246.0 games wl	hile ther	a ware					lahla	to nl	av.		
				e were	e stil	L Lega	L moves	avaı	LUDLE	to pr	uy.		
							L moves	avaı	Luble	to pi	uy.		
			******	****	****		L moves	avaı	Luble	to pi	uy.		
		PΊ	******* Laying M	***** atche	*****	*	L moves	avaı	Luble	to pt	uy.		
		PΊ	******	***** atche	*****	*	L moves	avai	LUDIE	to pro	ay.		
Match :	# Opponent	P1 ******	******* laying M ******	***** atche	**** 'S ****	*	ustom_				uy.		
Match :	# Opponent	P1 ******	******* laying M *******	***** atche ****	***** S *****	* * AB_C		2 AE	_Cus		uy.		
Match :	# Opponent Random	P] ****** AB_Impro	******** laying M ******** oved A Lost W	***** atche *****	***** S *****	* * AB_C	ustom_	2 AE t V	_Cus	tom_3			
		AB_Impro Won   I 9	laying M byed A Lost W	***** atche ***** B_Cus	***** s ***** tom Lost	*  *  AB_C  Won	ustom_   Los	2 AE t V	_Cus	tom_3 Lost	.y.		
1	Random	AB_Impro Won   l 9   5	laying M byed A Lost W 1	***** atche ****  B_Cus on   9	***** ***** tom Lost	*  *  AB_C  Won  9	ustom_   Los   1	2 AE t V	3_Cus <sup>.</sup> lon   8	tom_3 Lost 2 4			
1 2 3	Random MM_Open MM_Cente	AB_Impro Won   l 9   5   7	laying M boved A Lost W 1 5	***** atche ***** B_Cus on I 9 I 6 I	***** s ***** tom Lost 1 4	*  AB_C  Won  9  6  6	ustom_   Los   1   4   4	2 AE t V	3_Cus <sup>-</sup> lon   8   6	tom_3 Lost 2 4			
1 2 3 4	Random MM_Open MM_Cente MM_Improv	AB_Impro Won   l 9   5   7   7	laying M boved A Lost W 1 5 3 4	***** atche ***** B_Cus on   9   6   7   3	***** s ***** tom Lost 1 4 3 7	*  *  AB_C Won 9 6 5	ustom_   Los   1   4   4	2 AE t V	3_Cus lon   8   6   8   7	tom_3 Lost 2 4 2			
1 2 3 4 5	Random MM_Open MM_Cente MM_Improv AB_Open	AB_Impro Won   L 9   5   7   7   ed 6   4	1 5 3 4 6	***** atche ****  B_Cus on   9   6   7   3   4	***** s ***** tom Lost 1 4 3 7 6	*  *  AB_C  Won  9  6  5  5	ustom_   Los   1   4   4   5	2 AE t V	3_Cus <sup>-</sup> lon   8   6   8   7   4	tom_3 Lost 2 4 2 3 6			
1 2 3 4 5 6	Random MM_Open MM_Cente MM_Improv AB_Open AB_Cente	AB_Impro Won   L 9   5   7   7   ed 6   4   r 6	aying M	***** latche ***** B_Cus lon   9   6   7   3   4   6	****** tom Lost 1 4 3 7 6 4	*  *  AB_C Won 9 6 5 5 5	ustom_   Los   1   4   5   5	2 AE t V	3_Cus <sup>-</sup> lon   8   6   8   7   4   5	tom_3 Lost 2 4 2 3 6 5			
1 2 3 4 5	Random MM_Open MM_Cente MM_Improv AB_Open	AB_Impro Won   L 9   5   7   7   ed 6   4   r 6	aying M	***** atche ****  B_Cus on   9   6   7   3   4	***** s ***** tom Lost 1 4 3 7 6	*  *  AB_C  Won  9  6  5  5	ustom_   Los   1   4   4   5	2 AE t V	3_Cus <sup>-</sup> lon   8   6   8   7   4	tom_3 Lost 2 4 2 3 6			
1 2 3 4 5 6	Random MM_Open MM_Cente MM_Improv AB_Open AB_Cente	AB_Impro Won   L 9   5   r 7   ed 6   4   r 6   ed 6	laying M  Lost W  5 3 4 6 4 4	***** latche ***** B_Cus lon   9   6   7   3   4   6	****** tom Lost 1 4 3 7 6 4 3	*  AB_C  Won  9  6  5  5  4	ustom_   Los   1   4   5   5	2 AE t V	3_Cus <sup>-</sup> lon   8   6   8   7   4   5	tom_3 Lost 2 4 2 3 6 5	- -		
1 2 3 4 5 6	Random MM_Open MM_Cente MM_Improv AB_Open AB_Cente AB_Improv	AB_Impro Won   L 9   5   r	laying M  Lost W  5 3 4 6 4 4	***** datche *****  B_Cus on   9	****** tom Lost 1 4 3 7 6 4 3	*  AB_C  Won  9  6  5  5  4	ustom_   Los   1   4   5   5	2 AE t V	3_Cus <sup>2</sup> lon   8   6   8   7   4   5   5	tom_3 Lost 2 4 2 3 6 5	-		

At first case, the timeout happened due to the performance of my laptop, although the search tree is pruned, the agent still can't go deep enough to find the good result. By doubling the time limits, the average performance of AB\_Improved and Cumstom\_score1(which is given in the lecture) does not change very much (maybe we still not go deep enough so the result doesn't change). But the result of another two heuristic decrease a little. Thus we can say that those heuristic works well with very little time limit, it can give us a swift feedback in small amount of time. But as the tree goes deeper, these heuristic does not robust any more, thus we need a more general and better heuristics. So that I stick with the Custom\_score1 since it has a better physical significance.