HEURISTIC_ANALYSIS

Algorithms:

I use three heuristic algorithms:

1. The length of current user's movement.
2. The length of current user's movement - the length of opponent movement.
3. Set the value to be the ratio of not moved blocks / total blocks. If this value is greater than 0.5, than use own movement, else than use own movement times 2 - opponents movement.

Winning rate against random opponent (win/lost):

	Custom	Custom_2	Custom_3
Min Max Algorithm	185/15	186/14	176/24
Alpha Beta Algorithm	188/12	181/19	179/21

Winning rate against greedy opponent (win/lost)

	Custom	Custom_2	Custom_3
Min Max Algorithm	124/76	136/64	122/78
Alpha Beta Algorithm	155/45	164/36	138/62

Conclusion:

From the data above, the alpha beta algorithm win/lost rate is 83.8%, the min-max algorithm win/lost rate is 77%. So alpha beta prune is slight better than min-max algorithm.

For the score function, custom winning rate is 81.5%. custom_2 winning rate is 83.3%, custom_3 winning rate is 76.8%.

The custom_2 is the best one in three algorithm.

- Custom_2 performance best compare to the rest two algorithms.
- Custom_2 is very easy for implementation.
- Custom_2's algorithm is very fast, compare to custom_3.