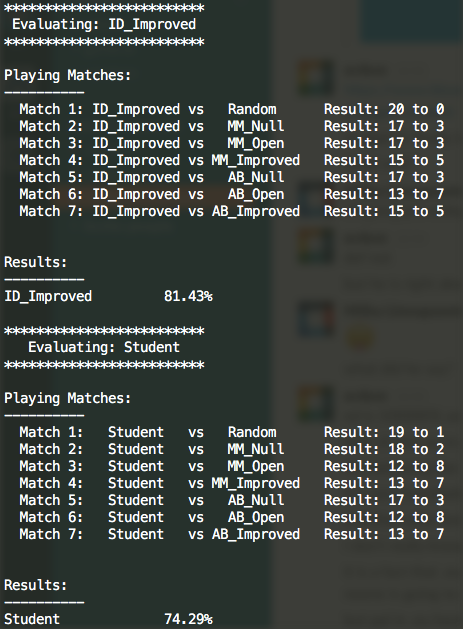
# Evaluation Functions and Performances

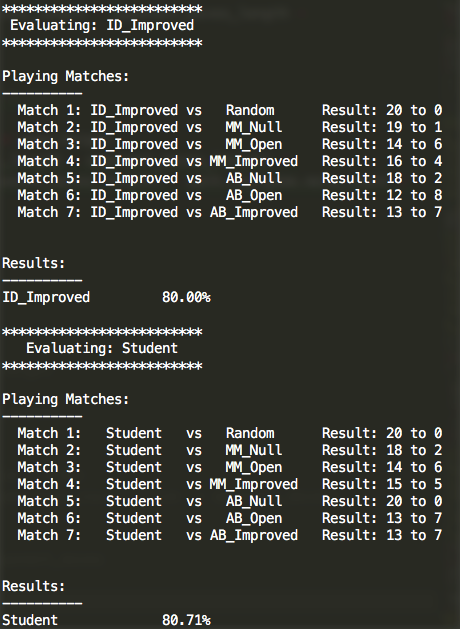
1. eval\_1: the difference of squares of own moves and opponent moves.

Balanced strategy which amplifies own and opponent moves exponentially. Weaker than ID\_Improved.



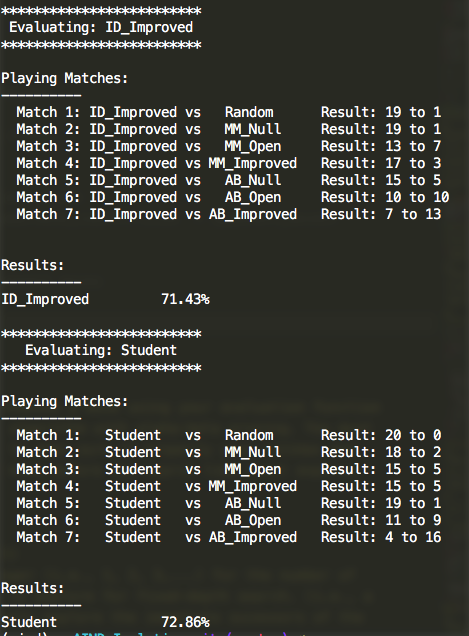
1. eval\_2: own moves – 2 \* opponent moves

a defensive strategy. Similar performance to ID\_Improved.



1. eval\_3: own moves – opponent moves – move count

balanced strategy which prefers less game progression. A bit more performant than ID\_Improved.



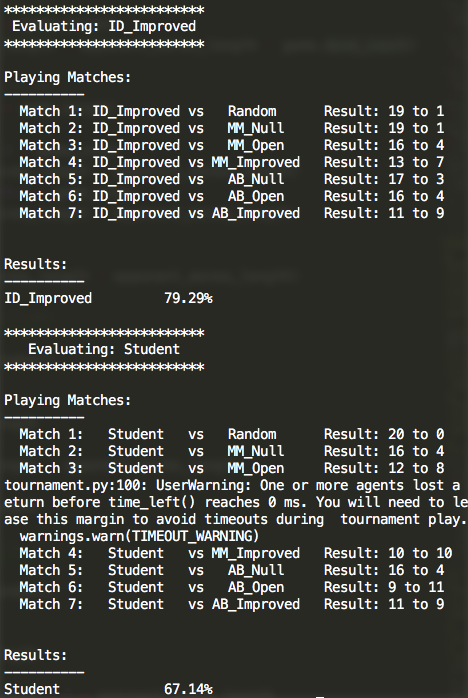
1. eval\_4:

if move count few: own moves – opponent moves

else if move count middle: own moves – opponent moves – move count

else: move count high: own moves – opponent moves

hybrid strategy based on game progression. Initially balanced, then also considers game progression, but in the end returns back to pure balanced strategy. Weaker than ID\_Improved.



1. eval\_5:

random selection, 40% own moves – opponent moves, 60% own moves – opponent moves – move count

hybrid probabilistic approach with combination of balanced and balanced with anti-progressive strategy. Weaker than ID\_Improved.

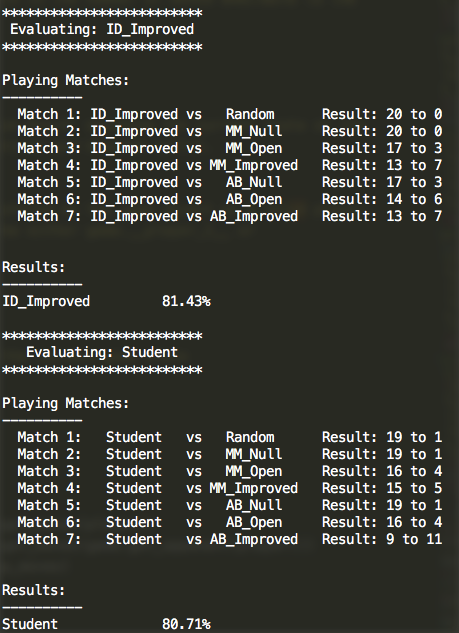


1. eval\_6:

move count < 0.9 \* game size: own moves – opponent moves

else: own moves – opponent moves – move count

hybrid strategy based on game progression. Until end of game balanced strategy. At the end anti game progression strategy. A bit weaker than ID\_Improved.



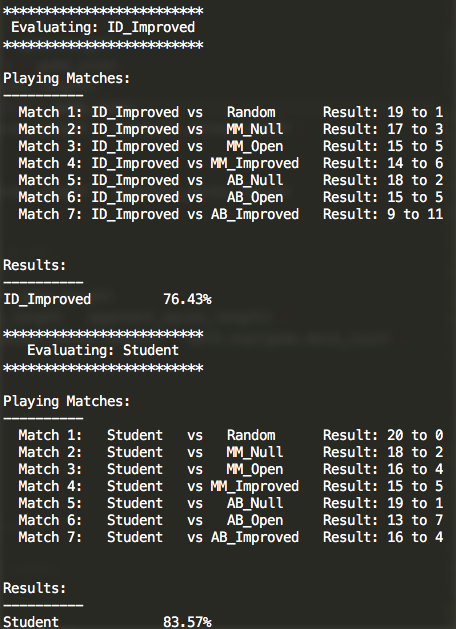
1. eval\_7:

if move count < 0.1 \* game size: own moves

else if move count < 0.9 \* game size: own moves – opponent moves + move count

else move count: own moves – opponent moves – move count

hybrid strategy. This time initially try open strategy. Until end of the game pro game progression strategy. At the end anti game progression strategy. More performant than ID\_Improved.

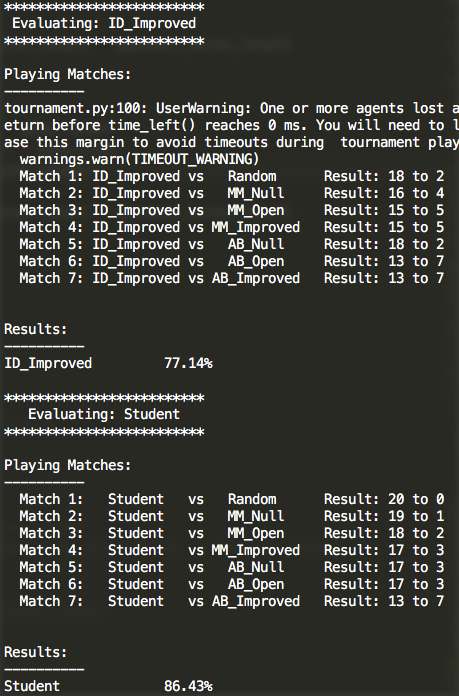


1. eval\_8:

if move count < 0.1 \* game size: own moves

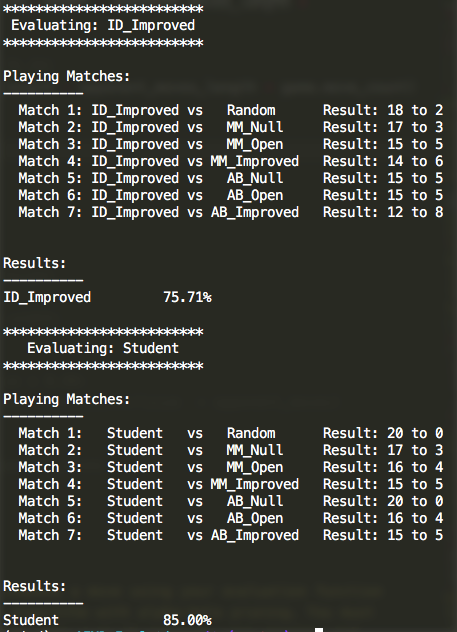
else: own moves – opponent moves + move count

hybrid strategy. Initially open, then pro game progression strategy. More performant than ID\_Improved.



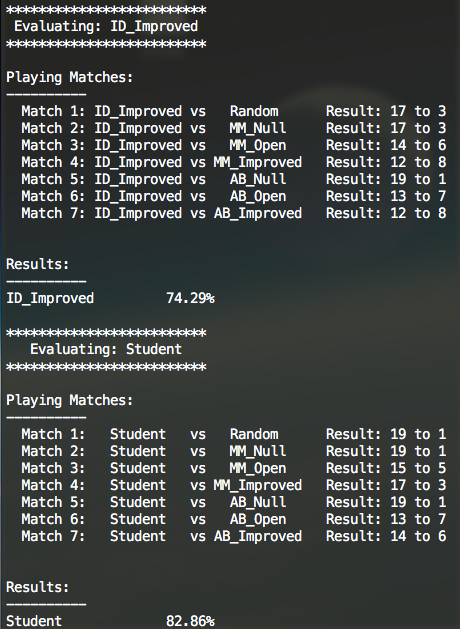
1. eval\_9: own moves – opponent moves + move count

balanced strategy with pro game progression approach. Remarkable more performant than ID\_Improved.



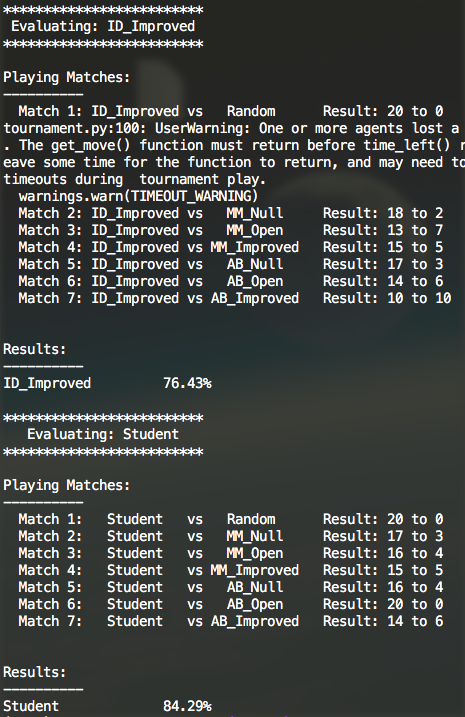
1. occupancy \* (own moves – opponent moves ) + move count

balanced strategy combined with occupancy and pro game progression approach. More performant than ID\_Improved.



1. occupancy \* (own moves – (2 \* occupancy) \* opponent moves ) + move count

hybrid strategy combined with occupancy and pro game progression approach. Adaptive offense/defense according to occupancy. Initially offensive, but then defensive approach. More performant than ID\_Improved.



# Recommendation for Evaluation Function

eval\_9 is the winner of all. As seen in eval\_7, 8, 9, 10 and 11 the pro game progression approaches ( + move count ) are clearly more performant. Balanced strategy also performs better than aggressively offensive or defensive strategies. Random and probabilistic approaches lead to weaker results as seen in eval\_4 and 5.

Hybrid approaches do not necessarily always improve the results as seen in eval\_5, 6 and 11.