

CENG 491

Computer Engineering Design

Weekly Progress Report - 6

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Work Done :

We have finished some of rule based agents namely No Tricks, No Hearts, No Queens.

This week, İlkan and Volkan completed rule based trump players. There are two versions of trump agents classified by their game level. The logic behind this players are similar, but the harder has more rules than the easier one. Thus, the harder version plays better when same cards are delivered. It does not mean in every situation the harder one wins because the luck factor is very important in trump games.

Firstly, the game logic behind the first version will be explained:

In trump games, the player who has the most trump tries to collect other players trump so that they can not throw trump to that player's high cards. Thus, first aim is to collect trump if it is possible in trump game. For this reason, if our player has trump suit's ace, king, queen or trump suit's ace, king and total 6 trumps, it tries to collect trumps.

Otherwise, there are three possibilities:

If the hand starter is our player, if it has a minimum suit (meaning that it has less than 3 cards for this suit), it wants to get rid of these cards to get a possibility of throwing trump. Else, it tries to win the turn. For this reason, our player finds the maximum in his hand and checks whether it is the maximum card of the game or not. If it is a maximum card, then our agent throws it. Else, it chooses the minimum card to throw.

If our player is second or third player, it checks whether a trump occurs in thrown cards and he has a card whose suit is first thrown suit. If this is true, it tries to get the hand with finding the maximum card of this suit. If it is the maximum card of the game, he throws it. Else, he throws the minimum card of this suit. Else if thrown cards contains

trump, player's hand contains the first thrown suit and the first thrown suit is not trump, player chooses the minimum card of that suit. Else if a card of first thrown suit does not exist in player's hand, if the player has trump, it looks how many cards of this suit are thrown in previous turns. If it is less than 8, it throws the minimum trump, else it throws the maximum. Else if the player does not have any trump, it chooses the minimum card in his hand to throw.

If our player is the last player, he checks whether his hand has a capability of getting hand. If it has, it chooses the minimum card that is enough for taking the turn. Else, it throws the minimum card in his hand.

Finally, the added rule for harder player will be explained:

If the player is second or third player, and has an ace and queen in same suit, it tries to get the turn with the queen if some conditions are hold.

Alper completed rule based no queens player. This game type of King game aims not take queen from any suits. The players who have taken queen(s) in one turn lose 120 points for each queen they have taken. If one player does not have the card from current turn's suit (s)he must throw queen if (s)he has queen. So players who throw queen reduces the chance of getting queens.

Alper has implemented two agents for this game type. Each agent in each turn knows the pastcards, current thrown cards on the related turn and its hand, then decides the card which it will throw. The agents are splitted out from each other by level difference. Two agents generally follow same algorithm but the one whose level is higher checks more specific cases. The agents generally decide the which card to throw according to below algorithm.

if -> starter of turn is itself

if -> all cards' rank in the hand is lower than queen

decide the card from available cards by checking the number of pastcards from the current suit

else->

if-> there is minimum type (whose # of cards at the beginning is lower than

3)

start from playing minimum type

else->

if ->there is possibility of stroke

throw min card from available cards by checking not the take
quenns from other players

else->

throw max card from available cards by checking not the take
quenns from other players

else->

if -> all cards' rank in the hand is lower than quenn

if -> our agent is striking (means agent does not have the card from thrown
suit)

throw max card

else->

if ->there is possibility of stroke

throw min card from available cards

else->

throw max card from available cards

else->

if-> our agent is striking

if-> available cards contains Quenn

throw Quenn

else->

if-> available cards contains Ace or King

prefer Ace or King

else->

throw max card

else->

if-> available cards contains Quenn

check the thrown cards

if->our agent can give the Quenn to other players

throw Quenn

if-> available cards contains Ace or King

if->our agent can give the Ace or King to other players

throw Ace or King

else->

if ->there is possibility of stroke

throw min card from available cards

else->

throw max card from available cards

else->

if ->there is possibility of stroke

throw min card from available cards

else->

throw max card from available cards

else if ->available cards contains Ace or King

check thrown cards

if->our agent can give the Ace or King to other players

throw Ace or King

else->

if ->there is possibility of stroke

throw min card from available cards

else->

throw max card from available cards

else->

if ->there is possibility of stroke

throw min card from available cards

else->

throw max card from available cards

Taylan has completed rule based no tricks agent. Players try to not to take the tricks. Each trick worths -30 points , therefore players usually throw small cards from their hands. Taylan implemented two version of rule based agent for NoTrick game. One of them is improved version of the other.

The game logic is like the following:

if player is first player

- do not throw the card which other players do not have any cards from that suit
- do not throw the card which is the biggest one from its suit.
- prefer the suit which has more number of cards in players' hand. And also throw

minimum of that suit.

else

if player has suit from the table's suit

1st: prefer the card which the biggest in hand and smaller than max card on

table

2nd: if player is not the 4th player, throw the smallest in hand

3rd: if player is the 4th player and there is no card available in the 1st preference,

throw the card which is the biggest one.

else

- do not throw the card which other players do not have any cards from that suit
- prefer the suit which has less number of cards in players' hand. And also

throw maximum of that suit.