Bidding

The basic idea behind the bidding logic is to take each suit and determine what the value of the cards we have would be if we bid in that suit. The highest value is the best bid we have.

We go through the same method for all 4 suits, with No Trump being handled on its own.

For suits the cards are given the following base values and bonus values:

|  |  |  |
| --- | --- | --- |
| Card | Base Value | Bonus |
| Right Bower | 1 | 0.30 |
| Left Bower | 0.75 | 0.20 |
| Ace | 0.60 | 0.15 |
| King | 0.50 | 0.10 |
| Queen | 0.40 | 0.10 |
| Ten | 0.30 | 0.10 |
| Nine | 0.20 | - |

Each card after the Right Bower can have a bonus applied to it. This bonus is based on any cards above it that are present in the hand.

Bonuses accumulate so while the Left Bower only receive a bonus from the Right Bower, the Ace receives the bonus of both the Right and Left Bowers if they are in the hand.

Additionally if neither Bower is present a -1 penalty is applied.

I also count non-trump Aces and Kings in the bidding with the following values:

|  |  |  |
| --- | --- | --- |
| Card | Base Value | Bonus |
| Ace | 1 | 0.40 |
| King | 0.2 | - |

No Trump needs to be handled much differently. We go suit by suit to determine the value of a hand and we do not even evaluate a suit if we don’t have the Ace. Bonuses only come from the Ace and King, since too many cards of a suit hurt your ability to bid No Trump I didn’t feel there was any need.

|  |  |  |
| --- | --- | --- |
| Card | Base Value | Bonus |
| Ace | 1 | 0.40 |
| King | 1 | 0.20 |
| Queen | 0.40 | - |
| Jack | 0.20 | - |
| Ten | 0.00 | - |
| Nine | 0.00 | - |

I may need to evaluate these values a little closer as it appears the AI will bid No Trump more often than I would expect.

Interpretation of the final values returned also ends up being important here. While developing other aspects of the program I am simply doing an integer evaluation of what is returned (2.4 = 2, 3.8 = 3, etc), but since do go to two decimal places you could do some more interesting things if you wanted an AI to play more conservatively or more daring.

Here are some examples of the evaluations that are done:

**Hand 1**

Ace of Clubs

King of Clubs

King of Diamonds

Queen of Diamonds

Queen of Spades

Nine of Hearts

Clubs:0.45

Spades:1.2

Hearts:1

Diamonds:1.6

No Trump:0

A pretty nothing hand, will indicate that the player should pass.

**Hand 2**

Nine of Clubs

Ten of Diamonds

Nine of Diamonds

Jack of Spades

Ace of Hearts

Queen of Hearts

Clubs:2.75

Spades:2.6

Hearts:0.25

Diamonds:1.2

No Trump:0

This would just barely go for a 2 Clubs bid, 2 Spades is probably a bit safer but having 2 trump to 1 takes precedence.

**Hand 3**

Queen of Clubs

Jack of Diamonds

King of Spades

Ten of Spades

Nine of Spades

Jack of Hearts

Clubs:-0.4

Spades:0.3

Hearts:2.25

Diamonds:2.25

No Trump:0

Hearts or Diamonds at 2, the way I have suit constants set up right now it would want to bid 2 Hearts.

**Hand 4**

Jack of Clubs

Ten of Clubs

Ace of Diamonds

Ace of Spades

King of Hearts

Ten of Hearts

Clubs:3.8

Spades:2.75

Hearts:1.9

Diamonds:0.8

No Trump:2

A lot more going on here, but ultimately it would come out to 3 clubs. If there were a higher 2nd club then the Ten we probably would have gotten to 4.