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DRL Bridge bidding Inventor (on-going work)

An attempt to learn and use bidding systems.
As an example we used the continuation after 1 Spade (5+,12-21 h.c.p) – 1 NoTrump (0-2 spades, 8-11).

The idea is to have a policy to recommend an action (bid) given a situation (hand and the previous bidding).

By using DDS as recommended bids for a number of relevant hands we can train a artificial neural network (nowadays called Deep Learning) via supervised learning (we have the answer, no need for/overkill with Reinforcement Learning)

To be able to extract the separate bids during the full bidding we selected a special block structure as in Fig 1. The net currently returns a weighted list of recommended bids. It can be extended to longer sequences with proper handling of pass bids thus dimensioned for i.e 5 bids in a sequence but can be finished in 3 via pass as bid 4 but the learning of 5 blocks takes longer.

Some experimental preliminar results:

One deal with 5233/14 and 2542/10, dds recommends 4 spades as best final contract but our net thinks 2H with weight 4.11, 3N w 4.03, 4H w 3.58 and 4S with only 3.05.

Improvements;
train with several dds-recommended cases; I have only used the first highest via one-hot encoding, maybe 4 H and 3 NT is as good or even better as our net guesses so let the net learn multiple cases.

Some preliminar runs will arrive (forgot to take care of too low, illegal bids).

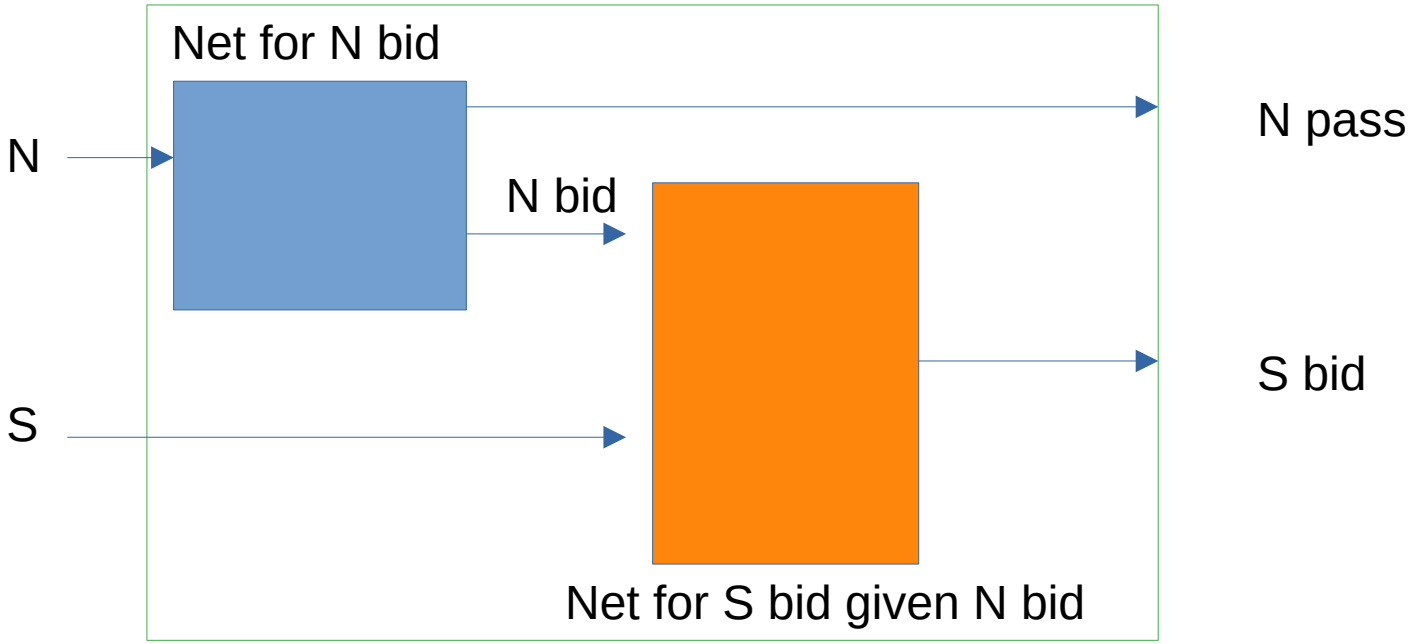

Fig 1. Total net to be trained on DDS-results given N hand with properties (shape and hcp and maybe more) and S hand with properties and final contract(s)
N = 5 inputs, S = 5 inputs, N bid = 15 signals, S bid = 35 signals (should be reduced to startbid 1 NT in our test case so 30 will reach 7NT)