Architectures of Intelligence
Assignment 3

Group 13
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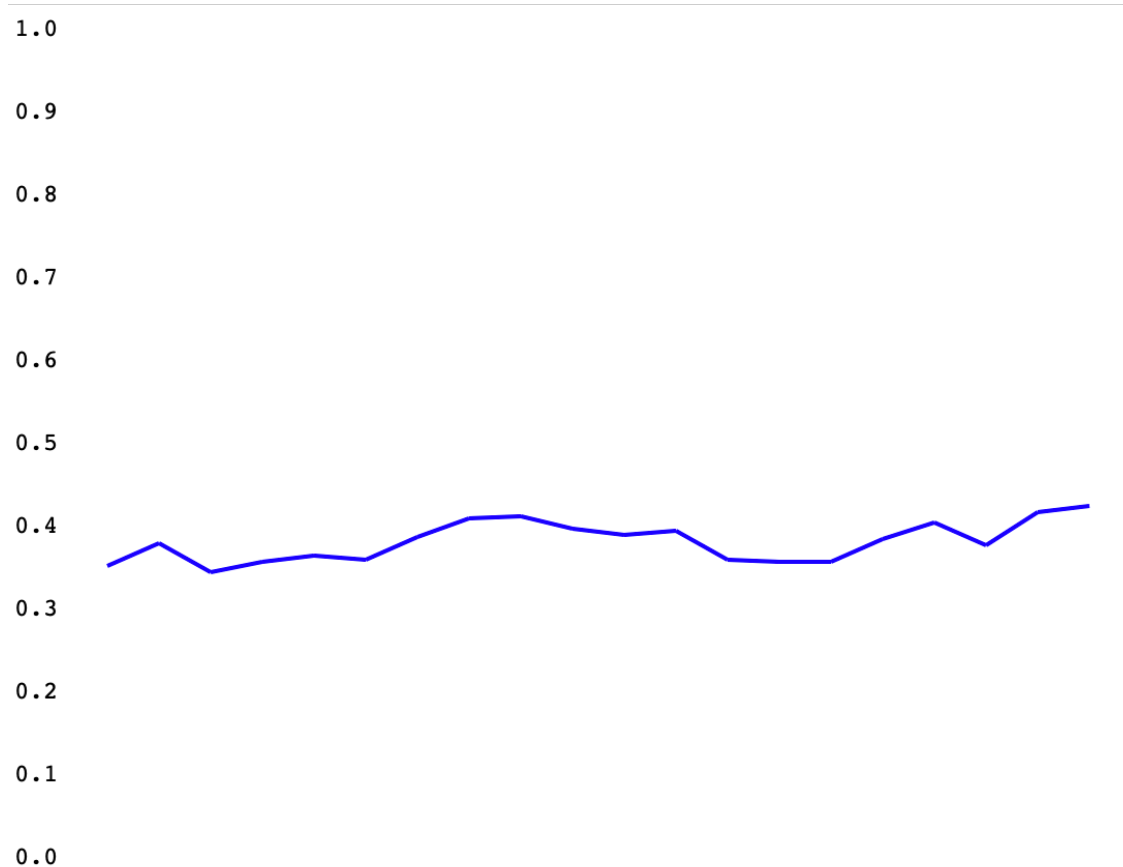
1-Hit Black Jack

Question a

Show the learning of your model in a graph like the one above.

Figure 1: *Graph visualizing the win percentage per hand.*

Listing 1: *percentage of wins of the model for 4 blocks of 25 hands each.*

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(0.35400003 0.3876 0.366 0.39639997)
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The graph showing the learning of the model depicts an increase over time, with a lower score, 0.35400003, for the first block of hands and an increase to 0.39639997 for the last block. In between there is a small decrease in values, however, since the model still calculates with 0.2 for : ans, this can also be due to noise.

QUESTION B

Describe which information you store in memory, and explain why. Also indicate what information you use to retrieve a past experience.

In our model, only *mstart* and *ostart* are stored in memory. That is because there are more possibilities for the first two cards to have the same value when added together, even though they differ individually. Since we are only interested in the total number of the card values added together, the sum is sufficient enough. Also, to apply small heuristics after retrieving, these values suffice. To retrieve past information, we use the same values we store, *mstart* and *ostart*.

QUESTION C

Explain why you need partial matching for this model; explain what would happen if you could not use partial matching.

Partial matching is useful if we want to retrieve data from memory which is similar to values we already encountered but not necessarily the same. Since the sum of the values for the first two cards is anywhere between 4 and 21, there are a lot of different sums to remember. This means, that without partial matching, it would take a lot of hands to remember all information needed. Partial matching, however, enables us to retrieve information of hands where the sum is slightly lower or higher but similar, so that the same action is applicable.

QUESTION D

Discuss whether this is a plausible model of playing black jack, and why/why not.

In general, the concept of remembering previous situations and act on in depending on what the result was is useful. In the context of playing Black Jack, this might not always be applicable. That is because Black Jack is highly dependent on statistics. Therefore, even though we might won in previous rounds with the same starting conditions, it is no statistically reasonable to take the same action again. Besides, the probability for cards shifts over time, since more and more cards are played. This means that it is best to dynamically decide on the action to take based on the cards already played which is not part of the model at all.