

2ID90 International Draught assignment

template report

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1 Introduction

Give a short introduction on your project: state the objectives and comment on how they are achieved. Furthermore, in the whole document, please take care of the following:

- *Refer to any material you used to obtain your results, e.g. [?].*
- *Illustrate your material with appropriate figures which are numbered and have a descriptive caption. Refer to the figure in the text: see Figure ??.*



Figure 1: The winners of the 2ID90 international draughts tournament, edition 2014.

- *Use pseudo-code to explain your algorithms. Note that pseudo-code is not the same as your actual java code. It should be an abstraction of that code and should be presented with readability and clarity in mind. Pseudo-code has to be accompanied with proper explanation and argumentation.*
- *Use numbered mathematical formulas instead of lengthy explanations in text. Additionally, discuss the principles behind the formula.*

2 Alpha-Beta

Give a full discussion of how you have implemented and extended the basic alpha-beta algorithm. Write your algorithms in pseudo-code, together with proper explanation and argumentation. Don't forget to refer to them: e.g. see Algorithm ??.

Algorithm 1 AlphaBetaMin

```
1 int AlphaBetaMin(node, alpha, beta) {  
    while (NewNodes not empty) /* loop over all children of node */  
3     ...  
    alpha := Maximum(alpha, Alpha ...) /* recursive call */  
5     if (alpha >= beta) return beta;  
    ...  
7 }
```

3 Iterative Deepening

Give a full discussion of how you have implemented iterative deepening. Pseudo-code has to be given, as well as a proper explanation and argumentation for it.

4 Evaluation

Give a clear explanation of your evaluation function. Compare alternative evaluation strategies, alternative parameter settings, etcetera. Argue why you have chosen a particular evaluation function: make measurements and use graphs and tables where necessary. Use formulas (like (??)) or pseudo-code:

$$H(s) = \begin{cases} \infty & \bigcirc(s) = 0 \\ -\infty & \bullet(s) = 0 \\ \bigcirc(s) - \bullet(s) & \text{otherwise} \end{cases} \quad , \tag{1}$$

where for board state s , $\bigcirc(s)$ and $\bullet(s)$ are the number of white and black pieces, respectively.

5 Custom extensions

Several extensions for alpha-beta, iterative deepening, and evaluation exist; for example: move ordering, handling quiescence, ignoring obliged moves on search depth, and transposition table. Each implemented extension needs to be clearly documented and its effect should be proven, e.g. by comparing implementations with and without the extension using e.g. graphs or tables, featuring, for instance, 'max search depth', and '#wins'.

6 Results

If you did not do so already in the previous sections, you can show your final results here. Again you can use graphs and tables to show your point.

7 Conclusions

A short logical summing up of the main reported results.

8 Contributions

A statement on the contributions of each of the authors.

	implementation	documentation	total #hours
Author 1	60%	30%	30
Author 2	40%	70%	25

- At least the given columns in the table need to be filled in, add columns if needed.
- Add comments to clarify your table entries when necessary.
- ...