MNK Game

Import the file in the eclipse IDE and run the Main file for executing the code then select the difficulty level. Now as soon as the user chooses its option the computer reply to this according to the level selected by the user.

I have used a different heuristic function other than the one mentioned in the book. In this heuristic function I have used values of heuristic value of 10^a. The heuristic function takes the negative value for the users move and positive value for the computer moves and a value zero in case of zero.

So basically what it does is

It make a 2D Boolean array of computer’s move and users move means an array computer[4][5] , user[4][5]. It calls the getcolumn, getrow, getdiagonal function which returns the Boolean bitsets (i.e the Boolean array)

Ex

Boolean array of user moves

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| T | F | F | F | F |
| T | T | F | F | F |
| T | T | T | F | F |
| T | T | T | T | F |

Getrow() function is applied on this it will return 4 array

TFFFF , TTFFF , TTTFF , TTTTF

Similarly on applying getcolumn() function it will return 5 array

TTTT , TTTF , TTFF , TFFF , FFFF

Same way for the getdiagonal will return diagonal element

Now the function for heuristic function is

**private** **int** getHeuristicValue(**boolean**[] bs) {

**int** score = 0;

**for** (**int** i = 0; i < bs.length; ) {

**int** j = i + 1;

**if** (bs[i]) {

**for** (; j < bs.length; j++)

**if** (!bs[j])

**break**;

score += Math.*pow*(10, (j - i + 1) );

}

i++;

}

**return** score;

}

The output of the “getcolumn”, “getrow” ,“getdiagonal” three function is taken as input in the given function which calculate the heuristic value of the all the children’s generated at each level, that value is given to the alphabeta function for applying alpha-beta-pruning .

In function if it gets consecutive true for any of the move computer or user it add it up to the score and I there are 4 consecutive “X” it will add up -100 –1000 -10000 giving us the value less than -10^4 making user winner .The same happens for computer for user move in which it comes same positive value this way heuristic function works.

In case of difficulty level we pass the “lookuplevel” which specifies the depth of tree till which level the child’s to be generated .