Assignment1 : COL333

Magic Cube and Tic Tac Toe

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List of Java files

1. MagicCube3D.java

2. MagicCube2D.java

3. TicTacToe3D.java

4. Player3D.java

5. Position3D.java

Brief Description

1. **MagicCube3D.java** : This file generates a magic Cube of any odd order n and prints it out. In this cube, there are two types of exceptions - one where sum is MagicConstant() and non-collinear and one which are collinear and still sum is not magicConstant. We have generated and stored both exceptions in different vectors.

2. **MagicCube2D.java** : This file generates a magic square of order n where n is odd.

3. **TicTacToe3D.java** : The game starts asking player whether to play first. The score of a player is computed by the number of collinear lines of the player. When it is computer's turn, the program first checks for a block leading to maximum score a computer can score and the maximum score that it can block of player. If former is greater than or equal to latter than computer plays in the block to score maximum score else it tries to block the player. If either of the above 2 possibilities are not possible, the program tries to mark that block where there are 2 possibilities for the winning state so that there is sure win in the next turn. When the program exhausts its options, it firstly tries for random allocation at free corners then free central block of all faces and if exhausted then allocates randomly in any free block. The game ends after 20 moves and the winner has more number of collinear lines in the cube. Collinearity is checked using magicCube concept and generated exceptions are taken care of.

4. **Player3D.java** : A supporter class for both the players containing player id (3 for X and 5 for O) and positions occupied by the player in the cube.

5. **Position3D.java** : A supporter class for 3D position.

References

1. https://en.wikipedia.org/wiki/Magic_square

2. https://en.wikipedia.org/wiki/Magic_cube

3. http://math.ku.sk/ trenkler/05-MagicCube.pdf