Signifying Board Completion

We found that it would be helpful for the players be able to see which groupings were completed at any point in the game. We decided the best way to do this would be to draw over the board using two colors (red and blue) to signify which player had completed which grouping. We had also decided that layering a JPanel above our board, where we could continually add graphic elements, would work best. We had to decide what how exactly we would create this effect between three styles. We intended to use the Graphics2D class when considering our possibilities. All of our options were within the limitations of this class.

**Shading**

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The initial solution to our plan was to highlight the rows, columns, and clusters the same color as the player that completed them. We would have implemented this by drawing rectangle graphics over the board as two layered JPanels. This was the first idea, and it did not get far in the decision-making process due to the appearance of the board after multiple groupings had been completed.

Pros:

* Clear technical implementation
* Clean design when few groupings had been complete
* Gives a finished board a look of “completeness”

Cons:

* No clear way to distinguish overlapping groupings
* Hard to identify completed groupings as a user
* No way to distinguish adjacent clusters and lines
* Overlapping completed groupings become indistinguishable

**Lines**

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The other extreme we considered was to use lines to signify completed groupings. We would use lines to cross out completed rows and columns, while outlining the clusters. While using lines solved some of the problems of the “shaded” design had, other problems arose with the appearance.

Pros:

* Always able to see completed groupings
* Board will look clean even at completion
* No confusion when groupings overlap

Cons:

* Board looks empty even when complete
* Clusters do not always appear completed at first look
* Time it would take to research creating a box outline
* Math required to place lines over board

**Hybrid**

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We combined the alternatives we had so far to create a “hybrid” design. Rows and columns are denoted as completed by lines, following our second model. Clusters become shaded when completed. This way, the clusters are clearly completed to the users, and the board still gets a complete feel when the game is over. This design also preserves the clean distinction for rows and columns from our second model.

Pros:

* Always able to see completed groupings
* Board will look clean even at completion
* No confusion when groupings overlap
* Clear technical implementation
* Gives a finished board a look of “completeness”

Cons:

* Having to darken the lines and lighten the boxes so that lines do not blend in
* Math required place lines over board

**Final Decision**

We have decided to use our hybrid model, as it combines the best elements of the other two designs. The design is well within our technical limitations, and is the most visually appealing. We had almost decided to go with the lines model due to the neatness in the design, but the completed board did not look as complete or satisfying as the hybrid model. Because the hybrid model is the same as the line model except for the clusters, we may use the line model if the hybrid model is impossible to achieve in our given time frame.

Signifying Board Completion

One of the design problems that we ran into was how the scoring for our game was to work. Because we are combining the games of Yahtzee, Sudoku, and Dots, we had to create our own method of scoring that implemented pieces of each one. Most of this process came fairly easily and didn’t offer many places too have alternatives, but there were a few spots that we really needed to make a choice of how we wanted the scoring to work. The main issue was at the end of the game, whoever took the last turn would be able to automatically score 3 times.

**Each player gets to score whenever they fill a cluster, row, or column**

This design would continue to prompt one player to score while they still had spots to score in. May be difficult to write the code for whose turn it is to score.

Pros:

* Could create more strategy for the game

Cons:

* Could be harder to implement figuring out who should score
* Last player gets to score 3 times to finish game

**Players take turns scoring, no matter who fills the cluster, row, or column**

Design: This design alternates score as there are places to score no matter who finished the cluster, row, or column.

Pros:

* Balances game between the players better
* Makes it easier to play the game
* Less weight on finishing a row, column, or cluster and more on what numbers are played

Cons:

* Could remove some strategy from game
* Might make game too easy, not as much thought

**Final Decision**

We decided to implement the second option of scoring just alternating between players as opposed to the scores only going to the player who finished the row, column, or row. We decided to go with this implementation because it seems like it will be much easier and more logical to implement and also create a better environment for the game. One player would be able to run away with the game if we went with the other option, and it would still leave the problem at the end of the game. We believe that by choosing this design, our end product will benefit greatly and the process to get there will be easier.