# CHAIN REACTION

## AP - Project

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# Implementation Of Game

- Functionality -
  - Two games run side by side one for saving the state of game(Non-GUI), and other for GUI.
  - Settings page shows equal number of options as the number of players selected.
  - Start game initiates the game by adding players and constructing the grid.
  - Players are added in the queue, and takes turn one by one.
  - Each turn adds one ball in the respective cell and if cell is full, Recursive calls used for exploding each cell.
  - After each turn number of players left is checked and Winner Exception is thrown if there is only one player left in game.
  - Option of new game is popped when winner is declared.

- Design Pattern Used -
  - Template - Whole algorithm of game is defined in the Main class
  - Facade - Main class in managing the all the pages and both GUI and non-GUI game
  - Iterator - Used to iterate over Players list.
  - Singleton - Only one game is running in whole Project at a time.
  - Adapter - Non GUI game is Converted to GUI game in deserialization.
  - Chain of Responsibility- When game is initialized it further calls initialization of matrix of cell which further calls initialization of cells which is further used in javax scene.

# Individual Contributions

**Yash Tomar-**

- Animation
  - Parallel Transitions
  - Rotation
  - Added sound
- GUI
  - Grid
  - Menu Page
  - Settings page
  - Color Picker

**Kshitiz Jain-**

- Serialization
  - Undo
  - Resume
- GUI
  - Winner Dialogue box
  - Some buttons including their working
- Design Implementation (Backend)

# Problems Faced

- Serialization
  - JavaFX is non serializable, so GUI cannot be saved - Saving the backend Game was the solution used. Retracing the whole backend again to GUI game at every click.
  - Saving the backend game and then generating whole game to GUI - Adapter Design pattern(Methods and attributes) to resolve the problem
- Parallel Transitions
  - So firstly when I added animation I called parallel animation function and added orbs in neighbors so before animation was finished the orbs were added in neighbors already so later I used setOnFinished function so that orbs are only added when the animation is finished.
  - So when in cell when orbs are greater than critical mass i.e. when orbs comes parallel so in my code they actually don't come in parallel one orbs come first and other later so my animation was called twice so this overlaps animation so I made two conditions when orbs are greater than critical mass do nothing just add orb and when is equal to critical mass just do normal split.

# Bonus

- Color Picker
- Settings page shows equal number of options as the number of players selected.
- Menu Page is modified - GUI is improved by using radio buttons and many more.
- Sound effects added.
- Undo is possible after resuming game.