

**INDIAN INSTITUTE OF INFORMATION TECHNOLOGY, ALLAHABAD  
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**Object Oriented Methodology Lab**

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**OOM Mini Project: Pair Duels (*Tile matching memory game*)**

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**Abstract of the project**

Pair duels is a memory battle between two players. This project utilizes JavaFX libraries. Player will choose any tile, turn wise according to their choice. Main objective is to expose the correct tile which is determined by the other player. Game is played in several steps-

1. Player-1 starts the game by opening a tile and then tries to match it by finding a similar tile.
2. For a player, after opening two tiles, turn shifts to the other player.
3. Now similarly, Player-2 opens a tile and then tries to match it by finding a similar tile.
4. Any tile which does not matches the initial tile for a player will be exposed for 0.5 seconds and then reversed (hidden).
5. If the pair of tiles matches for any player, then that player gets 10 points.
6. Player-1 and Player-2 have to pay attention to each other's moves and remember the position of the tiles. In this way, player having better memory gets advantage.
7. The game continues till all the pairs are found.

This game tests memory and concentration of both the players.

In this game we create a private Tile class and use it to make a grid of specific size.

Tile class is basically creating rectangular shapes using Rectangle class from “**javafx.scene.shape.Rectangle**” library to format the grid components (rectangles) to our requirements. Method “**createContent**” creates grid using “**ArrayList**” and sets it on a “**Pane**” and shuffles the tiles using “**Collections.shuffle(tiles)**”.

A game logic method is implemented. This method uses an open () and a close () method to display and hide the tiles according to logic. Both the functions will use animation classes from “**javafx.animation**” library to hide and show the pictures. Players have to memorize the tile in number of seconds equal to the number of tiles per row. Player with the higher score wins.

## **Specific Technology**

Java, JavaFX and related technology.

## **Project Tasks**

Use-Case Analysis, Sequence-Diagram, Activity-Diagram, Design: Class-Diagram, Implementation, User Interface.

## **Functional components of the project**

### **Screens**

1. Main menu screen - Displays game title, start button, grid size selector, theme selector, contains a background gif(Graphics Interchange Format).
2. Game screen - Displays the game grid, player text objects, live scores of both players, text objects showing the player turn, rotating image of a character(acc. to theme) for indicating player's turn, sound button, reset button, stop button, contains.
3. Result screen – Displays final result of the game, contains exit button and a button which takes the players to Main menu screen, contains a background gif(Graphics Interchange Format).

### **Features**

- Fun two player game(Duel) with unique style and gameplay.
- Displays images based on theme selected.
- Displays and Hides pictures with animated transitions.
- Score is live.
- Grid size can be changed according to players' choice.
- Background sound changes with different themes.
- Background sound can be muted and unmuted with a single click.