App

+ int CELLSIZE = 32
+ int CELLHEIGHT = 32
+ int CELLAVG = 32
+ int TOPBAR = 64
+ int WIDTH = 576
+ int HEIGHT = 640
+ int BOARD_WIDTH
+ int BOARD_HEIGHT = 20
+ int INITIAL_PARACHUTES = 1
+ int FPS = 30
+ String configPath
+ GameConfig configObject
- HashMap<String, PImage> sprites = new HashMap<>()
List<Level> levels = new ArrayList<>()
- int currentLevelIndex = 0
- Level currentLevel
float score = 0
boolean wholeGameOver = false
float wholeScore

+ App()
+ void settings()
+ PImage getImage(String s)
+ void loadSprites()
+ String getColorFromCode(String code)
+ String getCodeFromColor(String color)
+ PImage getBallImage(String code)
# void loadLevels()
# void getLevel(int index)
+ float getLevelScore()
+ void addScore(float scoreAdded)
+ void drawScore()
+ void drawEnded()
+ void setup()
+ void keyPressed(KeyEvent event)
+ void keyReleased()
+ void mousePressed(MouseEvent e)
+ void mouseDragged(MouseEvent e)
+ void mouseReleased(MouseEvent e)
+ void draw()
+ void main(String[] args)

Ball

- Random random = new Random()
- int radius
- float currentRadius
- float xVelocity
- float yVelocity
- float x
- float y
- String color
- boolean isRemove
- boolean isAttract
- boolean isShrinking
- boolean isCaptured
- float shrinkFactor

+ Ball(float x, float y, String color)
+ int getRadius()
+ void setRadius(int newRadius)
+ float getCurrentRadius()
+ void setCurrentRadius(float newRadius)
+ float getX()
+ void setX(float x)
+ float getY()
+ void setY(float y)
+ float getXVelocity()
+ float getYVelocity()
+ void reverseXVelocity()
+ void reverseYVelocity()
+ void setXVelocity(float newXVelocity)
+ void setYVelocity(float newYVelocity)

GameConfig

- String filepath
- JSONArray levels
- HashMap<String, Integer> scoreIncreaseFromHoleCapture
- HashMap<String, Integer> scoreDecreaseFromWrongHole

+ GameConfig(String filepath)
+ JSONObject readConfig(App app)
+ String getLevelLayout(int levelNumber)
+ List<String> getBallsConfig(int levelNumber)
+ int getSpawnInterval(int levelNumber)
+ int getTime(int levelNumber)
+ float getScoreIncreaseModifier(int levelNumber)
+ float getScoreDecreaseModifier(int levelNumber)
+ Map<String, Integer> getScoreIncreaseFromCapture()
+ Map<String, Integer> getScoreDecreaseFromWrongCapture()

Level

- String layout
float scoreIncreaseModifier
float scoreDecreaseModifier
Tile[][] board
- LinkedList<String> ballsConfig
BallManager ballManager
List<Ball> balls
- LevelDisplay levelDisplay
List<Line> lines
Line currentLine
int totalTime
float remainingTime
- int spawnInterval
int spawnTimer
float remainingSpawnTime
boolean isTimeInitialized
boolean pause
boolean timeUp
boolean timeValid
int currentScore
Map<String, Integer> scoreIncreaseConfig
Map<String, Integer> scoreDecreaseConfig
Tile yellowTile1
Tile yellowTile2
List<Tile> yellowTiles
boolean tilesInitialized
boolean isLevelFinished
boolean isLevelEnded
- int frameCounter
- List<Float> remainingBallXPositions
- boolean startMovingRemainingBalls
- boolean ballShiftStarted
- float moveOffset

+ Level(int level, GameConfig configObject)
+ void setupLevel(App app)
# void drawLines(App app)
+ void drawBalls(App app)
- void drawRemainingBalls(App app)
void drawScoreAndTime(App app)
- void updateTimeAndSpawn()
void drawTiles(App app)
+ void draw(App app)
+ int getCurrentScore()
+ void startNewLine(int x, int y)
+ void deleteLine(int x, int y)
+ void addNewLinePoint(int x, int y)
+ void addNewLine()
+ void spawnNewBall()
+ boolean isCaptureSuccessful(String holeColor, Ball ball)
+ float calScoreChange(String holeColor, Ball ball)
+ void addScoreToAPP(App app, float scoreAdded)
+ void pauseTheGame()
+ boolean isLevelEnded()

+ String getColor()
+ void setColor(String color)
+ boolean isRemove()
+ void removeBall()
+ boolean isAttract()
+ void attractBall(boolean attracted)
+ void setShrinking(boolean shrinking)
+ boolean isShrinking()
+ void shrink(float distance)
+ boolean isCaptured()
+ void capturedBall(boolean captured)
+ void updatePosition()
+ void checkCollision()
+ void draw(App app)

+ boolean isLevelFinished()
+ void moveYellowTiles(App app)
+ void LevelFinishedAddScore(App app)
# boolean isValidTime(int time)

BallManager

- LinkedList<String> ballColors

+ BallManager(LinkedList<String> initialColors)
+ String getColor(int index)
+ void removeColorAt(int index)
+ int size()
+ List<String> getRemainingBallColors()
+ void addColor(String color)

LevelDisplay

- String layoutFile
- Tile[][] board
- App app
- List<Ball> balls

+ LevelDisplay(App app, String layoutFile)
+ void loadLevel()
+ Tile createTile(String c, int x, int y)
+ List<Tile> getSpawnTile()
+ List<Tile> getBallTile()
+ Tile[][] getBoard()

Line

List<Vec> points
int thickness

+ void addPoint(float x, float y)
+ void draw(App app)
+ boolean ballDistanceWithLine(Ball ball, Vec p1, Vec p2)
+ boolean isLineCollision(Ball ball)
+ void reflectBall(Ball ball, Vec p1, Vec p2)
+ boolean containsPoint(float mouseX, float mouseY)

Tile

- int x
- int y
PImage image
- String type
- boolean isHole
int hits

+ Tile(int x, int y, String type)
+ void setImage(PImage img)
+ PImage getImage()
+ void draw(App app)
+ int getX()
+ int getY()
+ String getType()
+ boolean isHole()
- float calBallCenterX(Ball ball)
- float calBallCenterY(Ball ball)
+ Vec getHoleCenter()
+ boolean isOverLap(Ball ball)
+ void checkCollision(Ball ball)
+ String attractBall(Ball ball)
+ void hitTile(Ball ball, App app)
+ void setYellowPosition(int x, int y, App app)
+ void setOldPosition()

Vec

- float x
- float y

+ Vec(float x, float y)
+ float distanceTo(Vec other)
+ Vec add(Vec v)
+ Vec normal()
+ Vec normalize()
+ Vec[] perpendicular()
+ float dot(Vec other)