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| Model |
| |  | | --- | | **SHAPE** | | - xCoord = int  - yCoord = int  - intialY = int  - lastXCoord = int  - lastYCoord = int  - vSpeed = int  - hSpeed = int  - width = int  - height = int | | + Shape( int newX, int newY, int newWidth, int newHeight)  + getXCoord () : int  + getYCoord () : int  + getLastXCoord() : int  + getLastYCoord(): int  + getInitialY(): int  + setXCoord(int newX)  + setYCoord(int newY)  + getHSpeed(): int  + getVSpeed(): int  + getHeight(): int  + getWidth(): int  + resetY() |  |  | | --- | | **Alien** | | - isAlive = boolean | | + Alien(int hSpeed, int vSpeed, int newSize)  + isAlive(): boolean  + destroyAlien()  + reachedEnd(int boundary): Boolean  + moveRight()  + moveDown()  + moveLeft()  + draw(Graphics g) |  |  | | --- | | **InvadersGameLogic** | | - screenHeight = int  - screenWidth = int  - alienShot= Shot  - shot = Shot  - barriers = BarrierArray  - alienInvaders = AlienArray  - ship = PlayerShip  - gameStatus = String  - gameVersion = String | | + InvadersGameLogic(String version)  + getGameStatus() : String  + getArray() : AlienArray  + getShip(): PlayerShip  + getShot(): Shot  + getBarriers(): BarrierArray  + getAlienShot(): alienShot  + moveAliens()  + checkStatus()  + shipMovement(direction: String)  + moveAlienShot()  + handleShotInteraction()  + shotAttempt()  - randInt(int min, int max)  + shotGeneration()  + playSound( soundName: String) |  |  | | --- | | **Shot** | | - shotFired= boolean | | + Shot( int startingRow, int newSpeed)  + Shot( int startingY, int newSpeed, int newWitdh, int newHeight)  + getShotFired(): boolean  + tryShot(int ShipLocation)  + newAlienShot(int newX, int newY)  + moveShot()  + checkHitRectangle(int targetX, int targetY, int width, int height)  + checkTextHit(int targetRow, int targetCol, int lastCol): boolean  + inBounds( int height)  + draw(Graphics g) |  |  | | --- | | **PlayerShip** | | + playerShip( int screenLength, int newY, int size, int newSpeed)  + inBounds(int boardWidth)  + move(String direction)  + draw(Graphics g)  + toString(): String |  |  | | --- | | **Barrier** | | - isHit = int  **-** barrierChar = char | | + Barrier(xcoord: int, ycoord: int, wide:int, high:int)  + barrierIsHit()  + getBarrierHit(): int  + barrierCharText(): char  + draw(Graphics g) |  |  | | --- | | **BarrierArray** | | - AMOUNT = int  - ROWS = int  - SIZE = int | | + BarrierArray(version: String)  + getBarriers(): Barrier[]  + getAmount(): int  - setBarriersText()  - createBarrierArray()  - setBarriersGUI()  + drawBarrierArray(Graphics g) |  |  | | --- | | **AlienArray** | | - NUM\_ALIENS = int  - ROW\_ALIENS = int  - moveRight = boolean  - aliens = Alien[][]  - leftBoundary = int  - rightBoundary = int | | + AlienArrary(String version)  + getAliens(): Alien[][]  + getNumAliens():int  + getRowsAliens():int  - createAlienArray()  - setAliens()  - checkBoundary()  + aliensMovement(int width)  + drawAlienArray(Graphics g)  - setGUIaliens() |  |  | | --- | | **Drawable** | | + draw(Graphics g) | |

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| View |
| |  | | --- | | **InvadersGameText** | | - BOARD\_HEIGHT = int  - BOARD\_WIDTH = int  - board = char[][] | | + InvadersGameText()  + createBoard()  - validLocation(int x,int y):boolean  - printBoard()  - drawBarriers(BarrierArray barriers)  - drawShip(PlayerShip ship)  - drawShot(Shot shot)  - drawAliens( AlienArray array)  - drawAlienShot( Shot shot)  + drawCurrentState(PlayerShip ship, Shot shot, Shot alienShot, AlienArray array, BarrierArray barriers) |  |  | | --- | | **InvadersGameGUI** | | - WNDOW\_WIDTH = int  - WINDOW\_HEIGHT = int  - gameStatus = String  - toDraw= Object[]  - scores = ArrayList<Integer>  - payerScore = int | | + InvadersGameGUI(InvadersGameLogic newLogic)  + updateScreen()  + updateScores(allScores: ArrayList<Integer>, newPlayerScore: int)  + displayError( message: String) | | **Canvas extends JComponent** | | + paintComponent(Graphics g) | |

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| Control |
| |  | | --- | | **InvadersGameController** | | - keyboard = Scanner  - startTime= long  - timer = Timer  - logic = InvadersGameLogic  - gui = InvadersGameGUI  - text = InvadersGameText  - drawableObjects = Object[]  - scores = Scores | | - InvadersGameController()  - updateStatus()  - playGui()  - playText() |  |  | | --- | | **TimerListener** | |  |  |  | | --- | | **KeyboardListener** | | + keyPressed(KeyEvent e)  + keyReleased(KeyEvent e)  + keyTyped(KeyEvent e) |  |  | | --- | | **Scores** | | - integers: ArrayList<Integers>  - scores = String  - filename = String | | + addLastScore(aScore: int, version:String)  - sortScores()  + getScores(): ArrayList<Integer>  - buildScores()  - readScores()  - writeScores() |  |  | | --- | | **RunMe** | | + main(String[] args) | |