University Of Crete – Computer Science Department

HY252– Αντικειμενοστρεφής Προγραμματισμός - Java

Διδάσκων: Ι. Τζίτζικας

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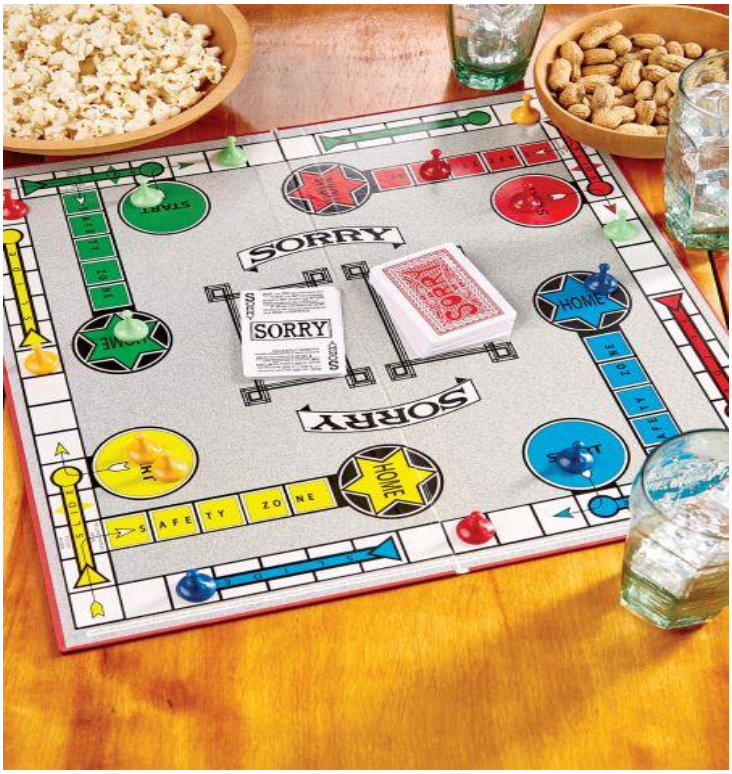

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AM 4152

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Contents :

- Introduction

Για την υλοποίηση της εργασίας χρησιμοποίησα το μοντέλο Model-View-Controller (MVC) . Συγκεκριμένα το model είναι ο εγκέφαλος του παιχνιδιού που υλοποιεί τις απαραίτητες κλάσεις για να μπορέσει να λειτουργήσει σωστά το παιχνίδι, το view ειναι η εικόνα που φαίνεται στον χρήστη όταν εκείνος χρησιμοποιέι το παιχνίδι , ενώ το Controller ειναι αυτός που ρυθμίζει για την σωστή επικοινωνία ανάμεσα σε model και view . Στις υπόλοιπες ενότητες υπάρχουν αναλυτικά για κάθε πακέτο : τα attributes και τα methods κάθε κλάσης καθώς και τα UML κάθε πακέτου.

- **Package Model**

-Abstract Class Card

When we create abstract class Card, we can access all of our data without specifing if a card is simple or specific.

Attributes :

protected String image. // String for the image path of a card.

protected String name. // String for the name of a card.

Methods :

public Card(String name, String image) //Constructor

1) public void setName(String name) // Accessor(Selector) ,Sets the name of the card.

2)public void setImage(String image) //Accessor (Selector), Sets the image of the the card.

3)public String getName() //Transformer(Mutative) , Returns the name of a card.

4)public String getImage() //Transformer(Mutative) , Sets the image of a card.

Classes that extend Card : NumberCard , SorryCard

-Abstract Class NumberCard

Attributes

1)private int number; //The number of the number card.

Methods

public NumberCard(Stirng name, int value, String image) //Constructor

1)public int getValue(); //Accessor , Returns the value of the card.

2)public void setValue(int number) //Transformer , Sets the value of the card.

-Class SorryCard

Attributes: -

Methods:

SorryCard(String name, String image) //Constructor

1)public boolean (pawn playerPawn, pawn enemyPawn) //Check if player can switch with his pawn.

2) public String toString() //Returns the description of the card.

Classes that extend Class NumberCard :

NumberOneCard, NumberTwoCard, NumberThreeCard,

NumberFourCard, NumberFiveCard, NumberSevenCard , NumberEightCard,

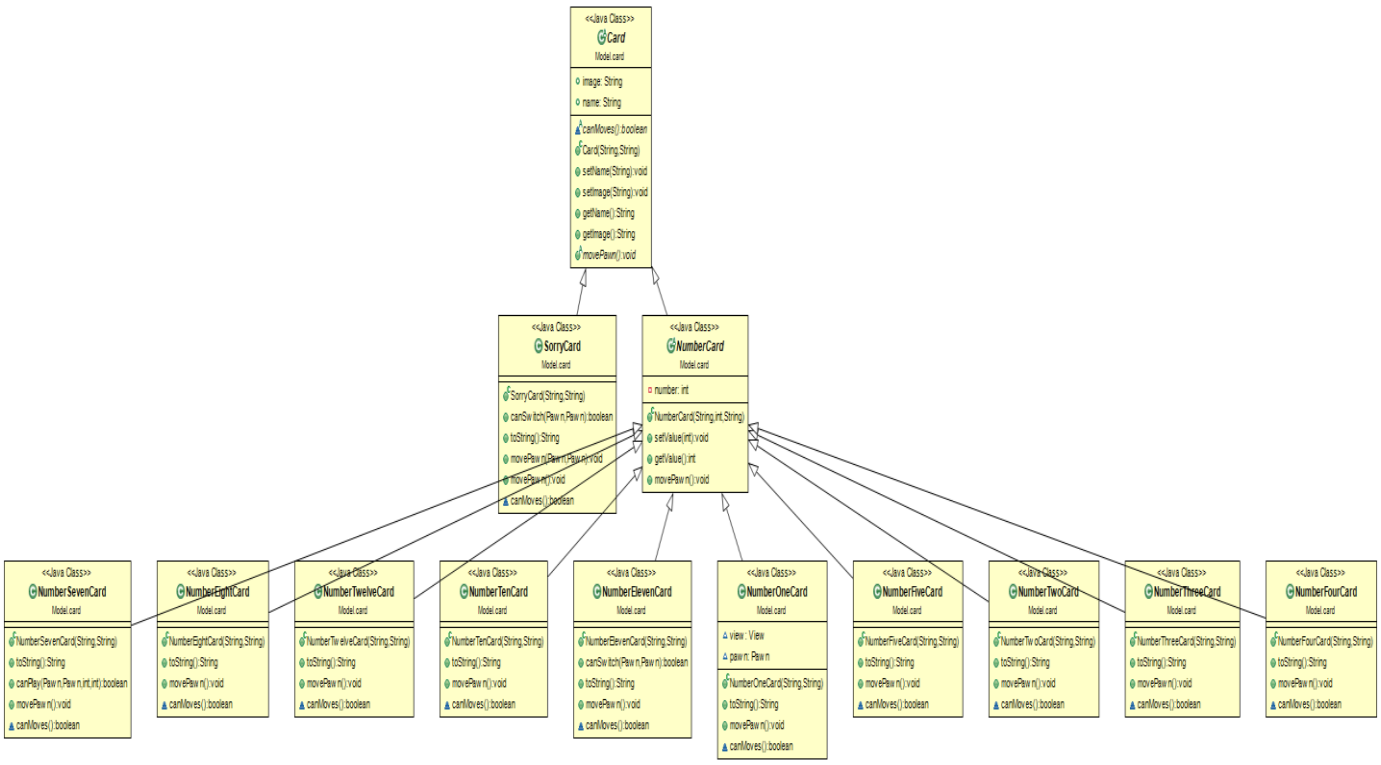
NumberTenCard , NumberElevenCard, NumberTwelveCard

These classes have access to class NumberCard with command super()

and initialize the attributes name, value(depending on the card) , image.

Each of this classes also have a toString() method that holds the string representation of each card.

UML for Package Card



-Abstract Class Square

Attributes

1) private int position //Position of the square.

2)private String name; // The name of the square.

Methods

public Square(int position, String name) //Constructor

1) public int getPosition() // Accessor (Selector) , gets the position of the square.

2) public int getName() // Accessor (Selector) , //gets the nameof the square.

3) public void setPosition(int position) // Transformer (Mutative) ,sets the position of the square.

4) public void setName(String name) //Transformer (Mutative) , sets the color of the square.

Classes that extend Square :

SimpleSquare, SafetyZoneSquare, StartSquare, HomeSquare, abstract class SlideSquare

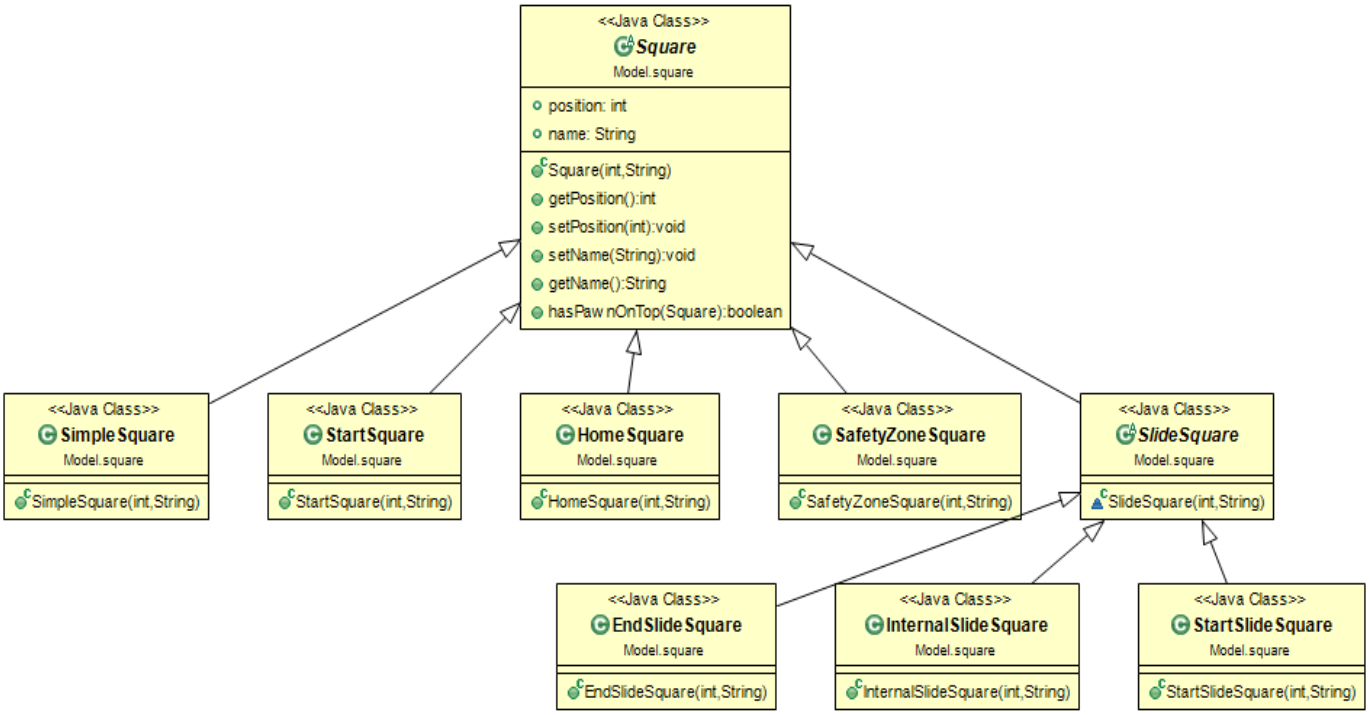
These classes have access to class Square with command super() and initialize the attributes position, name.

Classes that extend SlideSquare :

StartSlideSquare, InternalSlideSquare, EndSlideSquare

These classes have access to class SlideSquare with command super() and initialize the attributes : position, name.

UML for package Square



-Class Player

Attributes

1) private Color color //The color of the player.

2) private String name //The name of the player

3) private pawn pawn1 // pawn1 of the player

4) private pawn pawn2 // pawn2 of the player

Methods

Player(Color color, String name, Pawn pawn1, Pawn pawn2) // Constructor

1) getColor // Accessor(Selector) , gets the color

2) getName // Accessor (Selector) , gets the name

3) getPawn1 //Accessor (Selector) , gets the pawn1

4) getPawn2 // Accessor (Selector) , gets the pawn2

5) setColor // Transformer (Mutative) , sets the color

6) setName // Transformer (Mutative) , sets the name

7) setPawn1 // Transformer (Mutative) , sets the pawn1

8) setPawn2 // Transformer (Mutative) , sets the pawn2

9) public boolean isHisTurn(String name) //Checks if it is players turn, returns true or false.

Class Pawn

Attributes

1) private Color color; // The color of the pawn

2)private int position = -1; // The position of the pawn.

Methods

Pawn (Color color, int position) //Constructor

1)public void setColor(Color color) // Transformer (Mutative) , sets the color of the pawn.

2)public void setPosition(position) // Transformer (Mutative) , sets the position of the pawn..

3)public Color getColor() // Accessor(Selector) , return the color of the pawn.

4)public Square getPosition() //Accessor (Selector) , return the position of the pawn.

Class Deck

Attributes

1) ArrayList<Card> list //For the 52 cards in the deck.

2) int element = -1; //element for cards.

Methods

1)public Deck() //Constructor

2) public void intiCards() //Initialize the cards.

3) public ArrayList<Card> getGameCards() { // return the game cards.

4) public void setGameCards(ArrayList<Card> gameCards) // Transformer (Mutative) Sets the game card.

5) public void getNewCard // (Accessor) Let the user take a new card.

6) public void hasCardsLeft() // Checks if the deck has cards

7)public boolean canFold() //Checks if the player can press fold button

- **Package Controller**

This Class is the mind of the game. It is responsible for the connection between Model and View. It makes every action in order to make the game works in the right way. It is also responsible to show the end of the game and the winner.

-Class Controller

Attributes

1) public View view //a snapshot of class view

2) public Deck deck// a snapshot of class deck

3) public Player player1 //player1 of the game

4) public Player player2//player2 of the game

5) public Pawn[] pawns = new Pawn[4]; //an Array for the 4 pawns

6) public Square[] squares = new squares[73] //Array for the squares of the game.

7)private boolean hasStarted0 = false; //Check if pawns 0 has started.

8)private boolean hasStarted1 = false;//Check if pawns 1 has started.

9)private boolean hasStarted2 = false;//Check if pawns 2 has started

10)private boolean hasStarted3 = false;//Check if pawns 3 has started.

11)int count = 0; // Counter for the cards.

12) int dialogButton = JOpitonPane.YES_NO_OPTION; //dialog for card11

13) int dialogResult; //the result of the dialogButton

14)private int turn = 1; //Variable for players turn (Player1 plays 1st by default).

15)private int cardscounter = 44; // counter for cards.

16)private Card card; //A variable to store the data of every card

17)private NumberCard c; //A 2nd variable to store the data of every card

18) card7 =0; //Variable that help us to use card with number 7.

19) int k0 = -1; //Position of red pawn 1.

20) int k1 = -1; //Position of red pawn 2.

21) int k2 = -1;//Position of yellow pawn 1.

22) int k3 = -1; //Position of yellow pawn 2.

Methods

1) public static void main(String[] args) //Main method that creates a new controler snapshot.

2)public void initialize() // Initialize what is needed. (deck, view, pawns, squares, listeners).

3)initListeners() // Initialize all the listeners.

4) canStart0() //Check if red pawn1 can start

5) canStart1() //Check if red pawn2 can start

6) canStart2() //Check if yellow pawn1 can start

7) canStart3() //Check if yellow pawn2 can start

8) canMove0() //Check if the red pawn1 can move.

9) canMove1() //Check if the red pawn2 can move.

10) canMove2() //Check if the yellow pawn1 can move.

11) canMove3()//Check if the yellow pawn2 can move.

12) public void initPawns() //Initialize the pawns of the player.

13) public void initSquares() // Intialize the squares in the game.

14)public void removeAndReplaceCard() //Removes and replaces a card in the game.

- **Package view**

The package view includes all the graphics of the game. Specifically the view of the game includes the following :

-**Class View**

Attributes

1) private JFrame frame; // The frame of the game.

2)private JLayeredPane back; //The backround of the game.

//For the right side

3)private JMenuBar menu; // The menu bar .

4)private JButton foldButton , Card1; // Fold Button and the button for receiving card.

5)private JButton Card2 //Button for current card.

6)private JTextArea infobox; // A box with information for every card.

7)private JLabel ReceiveCard,CurrentCard; // Descriptions that write “ReceiveCard” && “Current card”.

//For the left side

8)private JLabel logo //Sorry logo at the centre of the board

9)private JLabel redHome , yellowHome; // A label for red home and yellow home boxes.

10)private JLabel redStart, yellowStart // A label for red start and yellow start boxes.

11) private JLabel backround // a label for the backround of the board

12) private JLabel txt1,txt2,txt3,txt4; //some texts inside the game

13)private JLabel[] square = new JLabel[100]; //the array for the squares in the game

14) private JButton[] pawns = new JButton[4] // An array of buttons for the pawns.

15)private JButton exit; //button to exit the game

16) private int index = 0; //variable that keeps the squares in the view.

17) private int i = 0; //temporary variable.

18) private int dialogButton = JOptionPane.YES_NO_OPTION;

//IMAGES

19) ImageIcon card1 = new ImageIcon("images/cards/backCard.png");

20) ImageIcon pawn0 = new ImageIcon("images/pawns/redPawn1.png");

21) ImageIcon pawn1 = new ImageIcon("images/pawns/redPawn2.png");

22) ImageIcon pawn2 = new ImageIcon("images/pawns/yellowpawn1.png");

23) ImageIcon pawn3 = new ImageIcon("images/pawns/yellowPawn2.png");

24) ImageIcon logos = new ImageIcon("images/sorryImage.jpg");

25) ImageIcon greenback = new ImageIcon("images/background.png");

Methods

1) public View() // Constructor of the game

2) public void initComponents() // Initialize all the components

3) public void initButtons() // Initialize all the buttons

4) public void updateCard(Card card) //Updates the card

5) public void updatePawn(int position, int p) //Update the pawn position depending on player's action.

6) public void updateInfobox() //Updates the infobox

7) public JButton getCardButton() // Returns the Button that the player press.

8) public JLayeredPane getBack() // Returns the back

9) public JTextArea getInfobox() // Returns the infobox

10) public JButton getPawn0() //Returns the 1st red pawn.

11) public JButton getPawn1()// Returns the 2nd red pawn.

12) public JButton getPawn2()// Returns the 1st yellow pawn.

13) public JButton getPawn3()// Returns the 2nd yellow pawn.

14) public JButton getFoldbutton() // Returns fold button.

15) public JButton getExitButton() //Returns the exit button.

16) public void showMessage() //shows message in the game.

17) public void resizeImages() //resize the images

18) public int returnMessage() //Returns the result of the dialog.

- **Η Αλληλεπίδραση μεταξύ των κλάσεων – Διαγράμματα UML**

Στην κλάση **Card** συνδέονται όλες οι κλάσεις κάρτων που την επεκτείνουν.

Στην κλάση **Square** συνδέονται όλες οι κλάσεις square που την επεκτείνουν.

Στην **Deck** αρχικοποιούνται όλες οι κάρτες στο ταμπλό (άρα η deck επικοινωνεί με την card και με όλες τις υποκλάσεις της).

Στην **Controller** αρχικοποιούνται τα τετράγωνα (μέσω της κλάσης Square) , οι παίκτες (μέσω της κλάσης Player), τα πιόνια(μέσω της κλάσης Pawn). Αρχικοποιούνται ξανά οι κάρτες τις τράπουλας όταν τελειώνουν (μεσω της Deck) . Ανανεώνονται τα πιόνια στην οθόνη σε κάθε κίνησή που συμβαίνει (μέσω της view). Βλέπουμε κάθε φορά ποια κάρτα εμφανόζεται στην οθόνη καθώς και το value της (μέσω της Card ή της NumberCard).

- **Λειτουργικότητα (Β Φάση)**

Δεν λειτουργεί ο έλεγχος για fold. Επίσης στις τσουλίθρες μόνο αν το πιόνι του αντιπάλου βρίσκεται στην αρχη της ή στο τέλος της θα πάει στην θέση start (καθώς περνάει ένα αντίπαλο πιόνι). Δηλαδή αν ένα πιόνι αντιπάλου βρίσκεται “μέσα” στις τσουλίθρα και περάσει κάποιο άλλο πιόνι δεν θα πάει στην θέση start.

Conclusion:

Γενικά ήταν ενδιαφέρον project και παρ’ ότι είχε τις δυσκολίες του , βοήθησε στο να εξοικειωθώ με την java**.**

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THE END