Monopoly: Reddit Edition

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The Problem

- Wanted to make a Monopoly game, couldn’t decide on a theme
- What is something we all love and doesn’t have it’s own Monopoly edition?
- Reddit!

Image from http://redditgifts.com/marketplace/product/reddit-alien-snoo-decal-small/

Project Description

- Basic rules and form of the original game, with small changes to the specifics and graphics
- Same layout as original board
- Names, values, and “currency” were changed to be consistent

Limitations

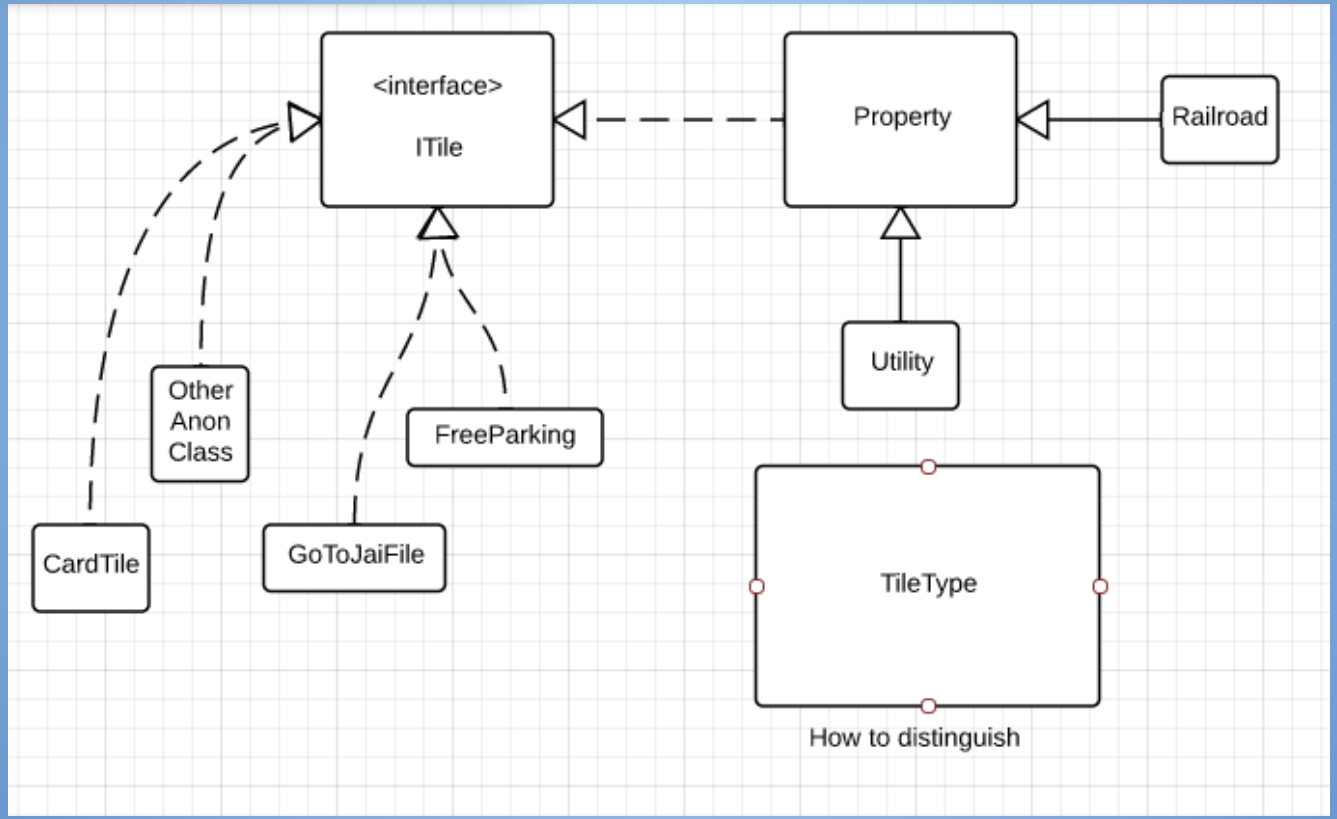
- We decided to choose AI over property management (houses, hotels, and trading)
- With AI, it would be difficult to implement an algorithm that would allow an AI player to make rational decisions about property management

The Model - XML

- Extensible Markup Language
- Generalization of HTML
- Used to save, load, and send objects
- Custom parser gets data and creates objects
- Loads the tiles and cards

```
<?xml version="1.0" encoding="UTF-8" ?>
<Tiles count="5">
        <Go></Go>
        <Property>
                <Name>Mediterranean Avenue</Name>
                <Value>60.0</Value>
        </Property>
        <CardTile>
                <Type>Community Chest</Type>
        </CardTile>
        <Property>
                <Name>Baltic Ave</Name>
                <Value>60.0</Value>
        </Property>
        <IncomeTax></IncomeTax>
</Tiles>
```

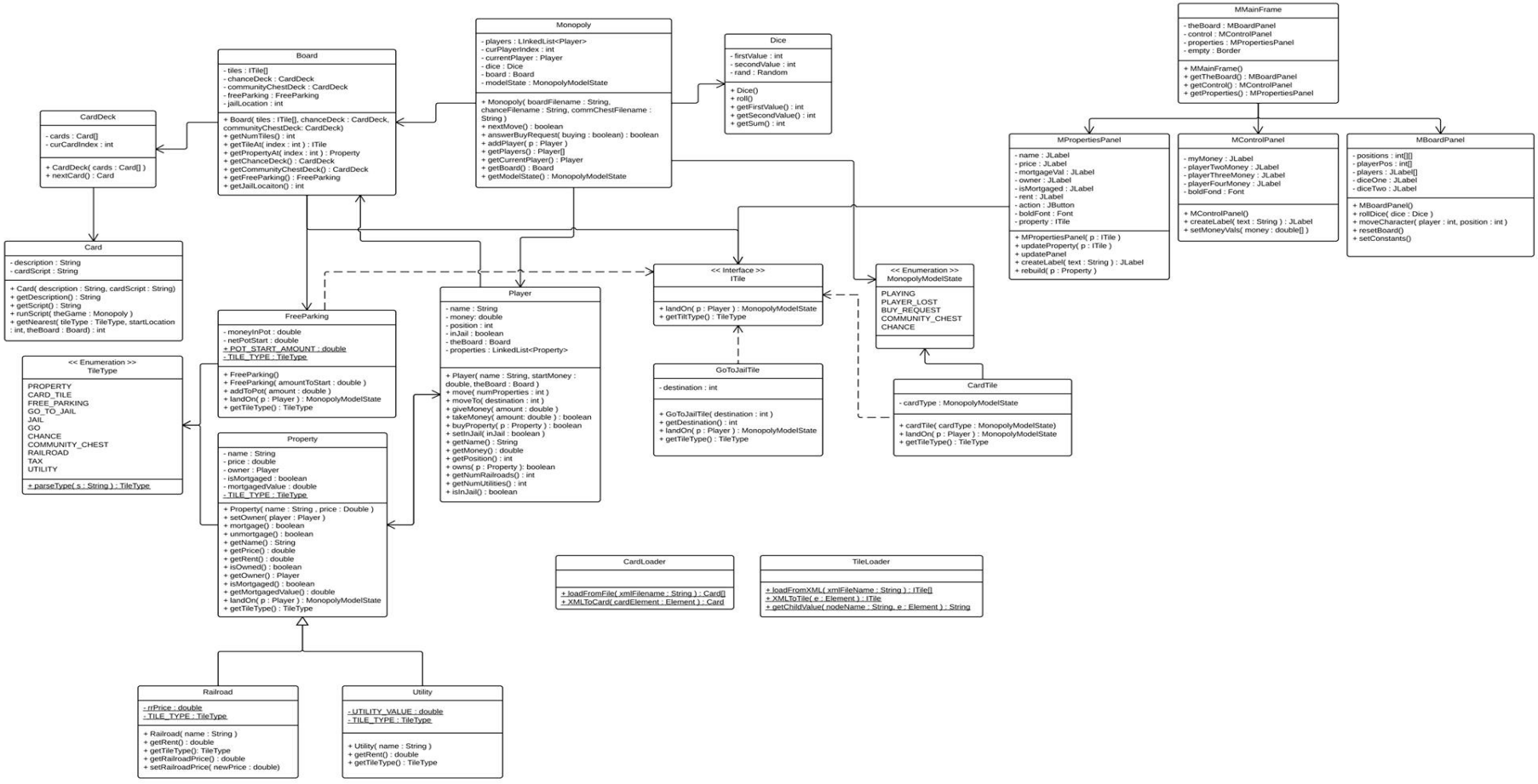
The Model - Tiles



The Model - Cards

- CardScript language
  - Simple functions “pay”, “collect”, “paytoall”, “railroad”, etc...
- Each Card has description and an associated script
- Cards are loaded from XML, randomized on load

Image from http://www.joelbieber.com/2012/01/bank-error-bad-money/


MMainFrame
- theBoard : MBoardPanel
- control : MControlPanel
- properties : MPropertiesPanel
- empty : Border
+ MMainFrame()
+ getTheBoard() : MBoardPanel
+ getControl() : MControlPanel
+ getProperties() : MPropertiesPanel
Monopoly
- players : LInkedList<Player>
- curPlayerIndex : int
- currentPlayer : Player
- dice : Dice
- board : Board
- modelState : MonopolyModelState
+ Monopoly(boardFilename : String, chanceFilename : String, commChestFilename : String)
+ nextMove() : boolean
+ answerBuyRequest(buying : boolean) : boolean
+ addPlayer(p : Player)
+ getPlayers() : Player[]
+ getCurrentPlayer() : Player
+ getBoard() : Board
+ getModelState() : MonopolyModelState
Dice
- firstValue : int
- secondValue : int
- rand : Random
+ Dice()
+ roll()
+ getFirstValue() : int
+ getSecondValue() : int
+ getSum() : int
Board
- tiles : ITile[]
- chanceDeck : CardDeck
- communityChestDeck : CardDeck
- freeParking : FreeParking
- jailLocation : int
+ Board(tiles : ITile[], chanceDeck : CardDeck, communityChestDeck: CardDeck)
+ getNumTiles() : int
+ getTileAt(index : int) : ITile
+ getPropertyAt(index : int) : Property
+ getChanceDeck() : CardDeck
+ getCommunityChestDeck() : CardDeck
+ getFreeParking() : FreeParking
+ getJailLocaiton() : int
CardDeck
- cards : Card[]
- curCardIndex : int
+ CardDeck(cards : Card[])
+ nextCard() : Card
MPropertiesPanel
- name : JLabel
- price : JLabel
- mortgageVal : JLabel
- owner : JLabel
- isMortgaged : JLabel
- rent : JLabel
- action : JButton
- boldFont : Font
- property : ITile
+ MPropertiesPanel(p : ITile)
+ updateProperty(p : ITile)
+ updatePanel
+ createLabel(text : String) : JLabel
+ rebuild(p : Property)
MControlPanel
- myMoney : JLabel
- playerTwoMoney : JLabel
- playerThreeMoney : JLabel
- playerFourMoney : JLabel
- boldFond : Font
+ MControlPanel()
+ createLabel(text : String) : JLabel
+ setMoneyVals(money : double[])
MBoardPanel
- positions : int[][]
- playerPos : int[]
- players : JLabel[]
- diceOne : JLabel
- diceTwo : JLabel
+ MBoardPanel()
+ rollDice(dice : Dice)
+ moveCharacter(player : int, position : int)
+ resetBoard()
+ setConstants()
Card
- description : String
- cardScript : String
+ Card(description : String, cardScript : String)
+ getDescription() : String
+ getScript() : String
+ runScript(theGame : Monopoly)
+ getNearest(tileType : TileType, startLocation : int, theBoard : Board) : int
<< Interface >>
ITile
+ landOn(p : Player) : MonopolyModelState
+ getTilrType() : TileType
<< Enumeration >>
MonopolyModelState
PLAYING
PLAYER_LOST
BUY_REQUEST
COMMUNITY_CHEST
CHANCE
FreeParking
- moneyInPot : double
- netPotStart : double
+ POT_START_AMOUNT : double
- TILE_TYPE : TileType
+ FreeParking()
+ FreeParking(amountToStart : double)
+ addToPot(amount : double)
+ landOn(p : Player) : MonopolyModelState
+ getTileType() : TileType
Player
- name : String
- money: double
- position : int
- inJail : boolean
- theBoard : Board
- properties : LinkedList<Property>
+ Player(name : String, startMoney : double, theBoard : Board)
+ move(numProperties : int)
+ moveTo(destination : int)
+ giveMoney(amount : double)
+ takeMoney(amount: double) : boolean
+ buyProperty(p : Property) : boolean
+ setInJail(inJail : boolean)
+ getName() : String
+ getMoney() : double
+ getPosition() : int
+ owns(p : Property): boolean
+ getNumRailroads() : int
+ getNumUtilities() : int
+ isInJail() : boolean
GoToJailTile
- destination : int
+ GoToJailTile(destination : int)
+ getDestination() : int
+ landOn(p : Player) : MonopolyModelState
+ getTileType() : TileType
CardTile
- cardType : MonopolyModelState
+ cardTile(cardType : MonopolyModelState)
+ landOn(p : Player) : MonopolyModelState
+ getTileType() : TileType
<< Enumeration >>
TileType
PROPERTY
CARD_TILE
FREE_PARKING
GO_TO_JAIL
JAIL
GO
CHANCE
COMMUNITY_CHEST
RAILROAD
TAX
UTILITY
+ parseType(s : String) : TileType
Property
- name : String
- price : double
- owner : Player
- isMortgaged : boolean
- mortgagedValue : double
- TILE_TYPE : TileType
+ Property(name : String , price : Double)
+ setOwner(player : Player)
+ mortgage() : boolean
+ unmortgage() : boolean
+ getName() : String
+ getPrice() : double
+ getRent() : double
+ isOwned() : boolean
+ getOwner() : Player
+ isMortgaged() : boolean
+ getMortgagedValue() : double
+ landOn(p : Player) : MonopolyModelState
+ getTileType() : TileType
CardLoader
+ loadFromFile(xmlFilename : String) : Card[]
+ XMLToCard(cardElement : Element) : Card
TileLoader
+ loadFromXML(xmlFileName : String) : ITile[]
+ XMLToTile(e : Element) : ITile
+ getChildValue(nodeName : String, e : Element) : String
Railroad
- rrPrice : double
- TILE_TYPE : TileType
+ Railroad(name : String)
+ getRent() : double
+ getTileType(): TileType
+ getRailroadPrice() : double
+ setRailroadPrice(newPrice : double)
Utility
- UTILITY_VALUE : double
- TILE_TYPE : TileType
+ Utility(name : String)
+ getRent() : double
+ getTileType() : TileType

The View - GUI

- Initial Design
- Additional Panels?
  - Properties
  - Control
- Parts on screen?
- How to create?

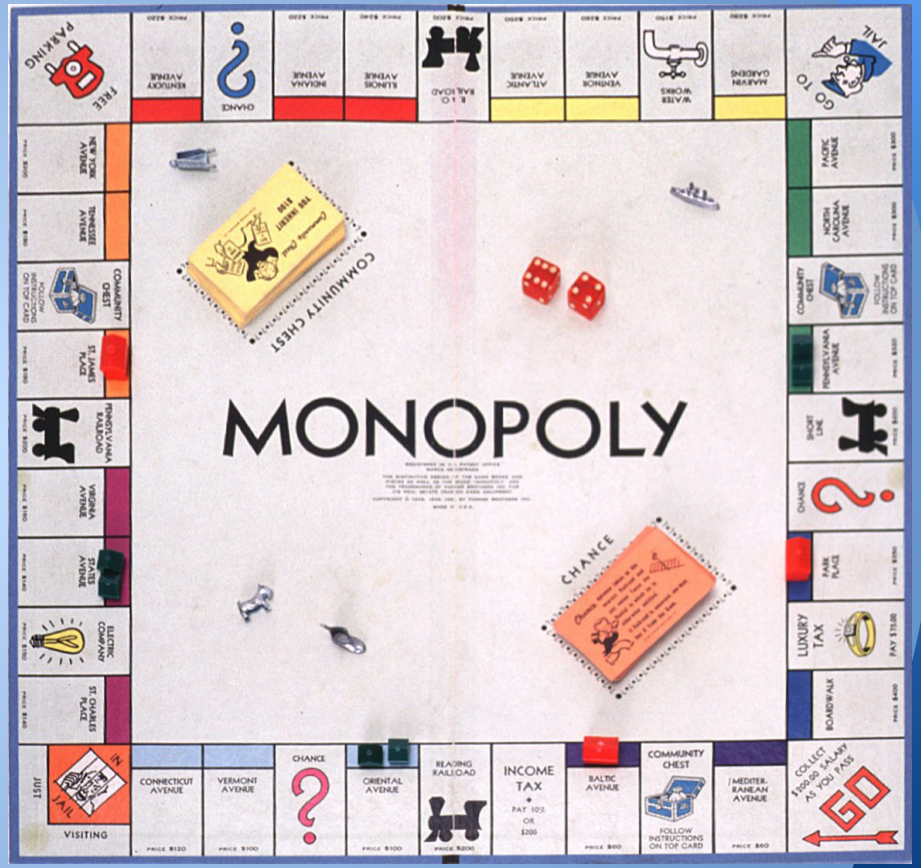


Image from http://www.freewebs.com/brettmeyer/monopoly%20board.jp

The View - GUI

- Swings
  - Components
- Different panels and frames?
- Methods available

Demonstration!

Image from http://thebeardnetwork.com/nicpb/

Future Features

- “Smart” AI
- Mortgaging
- Chance/Community Card JOptionPane
- Save Game/Load Game
- Settings
  - Change Player Name
  - Change Starting Cash