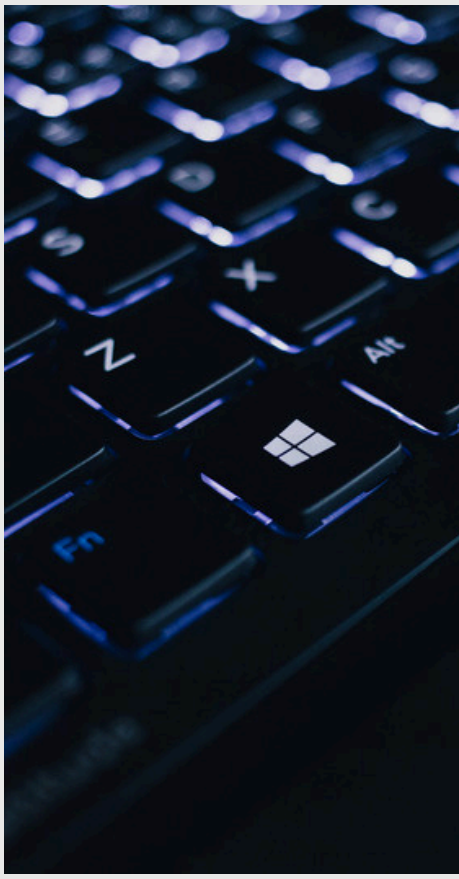
Project repport

UNO



Lien du github

02 Presentation de l’equipe

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- la classe deck

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- les classe Carte

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- la classe game + CircularDoublyLinkedList

Sommaire

01

deck

Methods and Attributes

The Deck class plays a central role since it manages all operations relating to cards, such as their distribution, their shuffling, their drawing, and the reconstruction of the draw pile during the game.

- **initgamepile():** master the first card in the game list in order to be able to start the game and place a second player card on top
- **initdeckpile():** creation and filling of the deck with the 108 cards of the game
- **shuffle() :** shuffle the cards in order to distribute them to the players
- **Drawcard() :** the Drawcard method which allows you to draw a card from the deck and returns the card you draw
- **deckisempty():** the deck is empty method to check if the player can draw. if it is not empty the player can draw otherwise we will rebuild the deck from gamepile
- **getfirstcard() :** we use this method to have the last card add to the game list to know if the next card that the player is going to place is playable or not
- **addtogamepile(Card card) :** the add to game pile method so that we can add playing cards to the game pile (gamepile)
- **resetdeck() :** the reset deck method to rebuild the deck from the game stack since it will contain almost all the cards, in case the deck has become empty and the game has not ended

02

Card

Attributes and Methods

- cette class Card est une supercalss de toute les class card du jeu et elle contient :
- **les variable suiante :**
- String color : qui désigne la couleur de la carte (jaune,verte,rouge,bleu).
- String effect : qui désigne l'effet de la carte (regular,special,wild) .
- **les fonction suivante :**
- getters : get color qui permet d'avoire la couleur de la carte
- get effect qui permet d'avoire l'effet de la carte
- setters : set color qui permet de modifier la couleur de la carte .
- set effect qui permet de modifier l'effet de la carte .
- afficher : qui permet d'afficher la carte .
- can play : toujour faux .

02.1

regular Card

Attributes and Methods

- cette class regular card est une class qui represante les carte basique du jeu (ex: 8 reouge) ,ces carte ne possedent aucun effet speciale mais possedent un num .
- **les variable :**
- int number : la valeur du chifre de la carte .
- string effect = “regular” : l’effet de la carte
- **les fonction :**
- getters and setters : ces fonction permetent d’accéder et de modifier la variable number .
- can play (Card c) : cette fonction permet de verifier si “this Card” peut etre jouer sur la card c (la carte et le retour de la dernier card sur le jeu).
- afficher : qui permet d’afficher la carte .

02.2

Plus 2 / Reverse Card

Attributes and Methods

- **plus2Card :**

cette class plus2card est une class de type special card qui à comme effect un +2 au joueur suivant .

les fonction :

getters and setters : ces fonction permetent d'accéder et de modifier la variable effect .

can play : expliquer précedement .

- **Reverse Card :**

cette class Reverse card est une class de type special card qui à comme effect retourner le sens du jeux .

les fonction :

getters and setters : ces fonction permetent d'accéder et de modifier la variable effect .

can play : expliquer précedement .

02.3

Skip / Wild Card

Attributes and Methods

- **Skip Card :**

- cette class Skipcard est une class de type special card qui à comme effect retourner le passer le tour du prochain joueur.
- **les fonction :**
- getters and setters : ces fonction permetent d'accéder et de modifier la variable effect .
- can play : expliquer précedement .

- **Wild Card :**

- les wild card est un type de carte qui a comme fonctionalité sz toujour pouvoir etre jouer et de d'imposer une couleur apres le jeux
- **les fonction :**
- getters and setters : ces fonction permetent d'accéder et de modifier la variable effect .
- can play :always true .

03

Player

Attributes and Methods

The Player class represents the player and their behavior, including all the methods related to this class.

- Constructor(name): Takes the name of the player as a parameter.
- receiveCard(card): Adds a card to the player's hand.
- canPlay(): Returns true if the player has a playable card.
- getNumCard(index): Takes an index as a parameter to select a card from the player's hand.
- voirCarte(): Displays the cards in the player's hand.
- chooseCard(topCard): Takes the last played card (top card) as a parameter and allows the player to choose a card from their deck.
- chooseColor(): Allows the player to choose a color when they play a wild card.
- poserCarte(numCard): Takes an index (numCard) as a parameter and returns the selected card from the player's hand.
- isUno(): Returns true if the player has only one card left in their hand.
- won(): Prints the name of the player who won the game to the console.
- getName(): Getter method to retrieve the name of the player.

03.1

BOT

Attributes and Methods

The class Bot is a subclass of the Player class. It concerns the non-player character (NPC). It inherits all the methods and attributes of the parent class Player, while redefining certain methods.

- Constructor(): Calls the constructor of the parent class using super to assign a name to the bot.

Redefined methods:

- chooseCard(last_card): Takes the last played card as an argument and uses it in the bot's selection algorithm. It stores all playable cards in an ArrayList and randomly selects one of them.
- chooseColor(last_card): Takes the last played card as an argument. After playing a wild card, the bot determines which color is the most frequent in its deck and selects that color.

04

Circular Doubly Linked List

The CircularDoublyLinkedList class manages a circular doubly linked list of players, enabling the addition, removal, and traversal of players while maintaining links between previous and next nodes.

Attributes:

- head: The first node in the list.
- tail: The last node in the list.
- current: The current node (used for traversal).
- size: The number of nodes in the list.

Constructor:

- Node(Player player): Internal constructor to initialize a node with a player.

Methods:

- getFirstPlayer(): Returns the first player in the list.
- getnext(): Returns the next player without advancing the current pointer.
- getprev(): Returns the previous player without moving back the current pointer.
- next(): Moves the current pointer to the next player and returns it.
- prev(): Moves the current pointer to the previous player and returns it.
- add(Player player): Adds a player to the end of the list.
- remove(Player player): Removes a player from the list.
- getSize(): Returns the number of players in the list.

04.1

Game

The Game Class is responsible for managing the core game mechanics, including turn sequencing, enforcing rules, and maintaining the game state.

Attributes:

- deck: The deck of cards.
- currentPlayer: The player whose turn it is.
- players: A circular list of players (real players and bots).
- currentCard: The current card on the discard pile.
- isReversed: Indicates whether the turn order is reversed.
- gameOver: Indicates whether the game is over.

Constructor:

- Game(int numberOfRealPlayers, int numberOfBots): Initializes the game, creates players, deals cards, and sets the initial state.

Methods:

- nextPlayer(): Returns the next player based on the turn order (normal or reversed).
- start(): Starts the game, manages player turns, and checks win conditions.
- handleSpecialCard(Card card): Handles the effects of special cards (Skip, Reverse, +2, +4, etc.).
- drawCards(int count): Makes the next player draw a specified number of cards.

04.4

FourColor / Plus4 Card

Attributes and Methods

- **1.7 FourColor Card :**

- FourColor Card est une sous class de la class wildcard cette carte permet d'etre toujours utiliser et imposer un couleur au prochian joueur

- **1.8 Plus4Card :**

- Plus4 Card est identique a FourColor card sauf quelle possedent l'effect plus4 en plus qui permet d'ajouter 4 carte au joueur suivent .