# Monopoly

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# Summary of Program

The program is called monopoly. It is a game, the user can set number of players, select size of board and set name of player at the beginning. Then, the user will start on a specific board. During the game, the user can roll a die for moving forward, buy properties in current position, draw card (chance/punishment). This game can end at any time or if only one player left who is not bankrupt then the game will end immediately and show the winner.

# Required Data Types

Table 1: Monopoly detail

|  |  |  |
| --- | --- | --- |
| Property | Type | Notes |
| monopoly | GameManager | a new monopoly |

Table 2: GameManager detail

|  |  |  |
| --- | --- | --- |
| Property | Type | Notes |
| numPlayer | int | the number of player |
| square | Position[] | square that used during the game |
| gameOver | boolean | whether the player lose |
| player | Player[] | player list |
| sc | Scanner | scan user input |
| QUESTION | char | the player ask for their information |
| MIN\_PLAYER | int | minimum number of player |
| MAX\_PLAYER | int | maximum number of player |
| SMALL\_BOARD | int | select a small board |
| BIG\_BOARD | Int | select a big board |
| BOARD\_SIZE | Int | size of the board |
| squareSelection | Int | user selection of square |
| START\_POS | Int | position of start |
| CHANCE\_POS | Int | position of chance |
| PUNISHMENT\_POS | Int | position of punishment |
| REST\_POS | Int | position of rest |
| price | Int | the price of the square |
| rent | int | the rent of the square |
| sum | Int | sum of price of properties |
| iniMoney | Int | initial money of player |
| INI\_POSITION | Int | initial position of player |
| INI\_PROPERTIES | Int | initial number of properties of player |
| name | String | name of the player |
| startGame | String | starting a game |
| START\_GAME\_YES | String | the user want to start a game |
| buy | char | whether the player want to buy properties |
| BUY\_YES | char | the player want to buy a property |
| dice | Dice | roll a dice |
| roll | char | key to roll a dice |
| ROLL\_YES | char | player want to roll a dice |
| card | CardCentre | draw a card |
| draw | char | key to draw a card |
| DRAW\_YES | char | the playerer draw a chance |
| numLoser | int | number of loser |
| displaySelection | int | selection of diplay |
| SHOW\_INFO | int | show information of the player |
| QUIT | int | quit the game |
| winner | String | name of winner |
| in | Scanner | scan user input |
| playAgain | char | whether the user want to play again |
| PLAY\_AGAIN\_YES | char | the user want to play again |

Table 3: enum CardTypedetail, declared in CardCentre

|  |  |
| --- | --- |
| Value | Notes |
| MONEY | will increase or minus the money of player |
| STEP | player can step forward or step backword |

Table 3: CardCentre detail

|  |  |  |
| --- | --- | --- |
| Property | Type | Notes |
| cardList | int[][] | card list |
| card | Int | what card was drawed |
| money | Int | how much money the player will have |
| step | Int | how mamny step the player need to move |
| drawCard | Int | drew a card |
| MONEY\_LIST\_POS | int | position of money list |
| drawer | Random | draw a chance randomly |
| CAPACITY | int | capacity of money and step list |
| LOWEST\_MONEY | int | lowest money in money list |
| SMALLEST\_STEP | int | smallest step in step list |
| moneyList | int[] | money list that provide a value of money to draw |
| stepList | int[] | step list that provide a value of step to draw |
| STEP\_LIST\_POS | int | position of step list |

Table 4: Dice detail

|  |  |  |
| --- | --- | --- |
| Property | Type | Notes |
| NUM\_FACES | int | number of sides |
| faceValue | int | current side of dice |
| generator | Random | to generate a face value randomly |

Table 4: Player detail, declared in GameManager

|  |  |
| --- | --- |
| Value | Notes |
| name | name of the player |
| money | how much money does the player have |
| position | which position the player stand on |
| numProperties | the number of properties that player has |
| gameOver | whether the player is lose |
| information | display the information of the player |

Table 5: enum Type detail, declared in Position

|  |  |
| --- | --- |
| Value | Notes |
| PROPERTIES | the square that user can buy |
| START | the square that user start playing |
| CHANCE | the square that user can draw a chance |
| PUNISHMENT | the square that user can draw a punishment |
| REST | the square that user can just task a rest |

Table 5: Position detail, declared in GameManager

|  |  |
| --- | --- |
| Value | Notes |
| owner | owner of the position |
| information | information of the position |
| price | price of the position |
| rent | rent of the position |
| type | type of the position |

# Overview of Program Structure

|  |  |  |  |
| --- | --- | --- | --- |
| Class | Name | Return type | Description |
| Monopoly | main |  | run a monopoly |
| GameManager | playerSetting |  | allow user to set the number of player |
| GameManager | squareSelection |  | allow user to select size of the board |
| GameManager | playerData |  | Assign the player's data with name, initial money, initial position, initial number of properties, whether he/she is game over |
| GameManager | playGame |  | Ask whether the user want to play a game, call other method to check position type, roll a dice, draw a chance and punishment, pay the rent, empty loser properties and show winner |
| GameManager | checkPosType |  | check the type of the position, then call other method for buying properties, pay rent and read card |
| GameManager | payRent |  | Allow player to pay rent, show how much money left of the player, show how much money of the owner of the propertiy has |
| GameManager | buyProperties |  | Show the price of properties, how much money the player has, allow player to buy properties, show how much money left of the player |
| GameManager | rollDice |  | Roll a dice, show player current position then calculate the player position |
| GameManager | drawCard |  | draw a card, call method chance or punishment |
| GameManager | chance |  | check the type of chance card calcualte how much money the player has after getting a chance card or show which position player is in after getting a chance card |
| GameManager | punishment |  | check the type of punishment card calcualte how much money the player has after getting a punishment card or show which position player is in after getting a punishment card |
| GameManager | gameOver |  | Check how many player are lose |
| GameManager | displayOrQuit |  | Display a menu that can show information of the player and quit the game |
| GameManager | winner |  | Show which player is winner |
| GameManager | lostEverything |  | If the player is lose, all of his/her properties will be empty |
| GameManager | continuePlay | boolean | Ask whether the user want to play again |
| CardCentre | checkCardAndValue | CardType | check the card and assign the value in appropriate variable |
| CardCentre | getMoney | Int | Returns the random value of money |
| CardCentre | getStep | int | Returns the random value of step |
| Dice | getFaceValue | int | Returns the current face value of dice |
| Dice | roll | int | Roll the dice and return the value of current face |
| Player | getName | String | Returns the name of the player |
| Player | setName |  | Set the name of the player |
| Player | getMoney | int | Returns the money of the player |
| Player | setMoney |  | Set the money of the player |
| Player | getPosition | int | Returns the position of the player |
| Player | setPosition |  | Set the position of the player |
| Player | getNumProperties | int | Returns the number of properties of the player |
| Player | setNumProperties |  | Set the number of properties of the player |
| Player | getGameOver | boolean | Returns whether the player is game over |
| Player | setGameOver |  | Set whether the player is game over |
| Player | changeMoney |  | change the money of the player and if it is less than 0 then the player will lose |
| Player | toString | String | Returns the information of the player |
| Position | getOwner | Player | Returns the owner of the position |
| Position | setOwner |  | Set the owner of the position |
| Position | getInfomation | String | Returns the infomation of the position |
| Position | setInformation |  | Set the information of the position |
| Position | getPrice | Int | Returns the price of the position |
| Position | setPrice |  | Set the price of the position |
| Position | getRent | int | Returns the rent of the position |
| Position | setRent |  | Set the rent of the position |
| Position | getType | Type | Returns the type of the position |
| Position | setType |  | Set the type of the position |