User Manual

Project Group 10

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Introduction

This manual is a user manual for monopoly game designed by group 10. The document includes a detailed rule to inform user of the game and all the user operations when facing different situations. Game rule is to let user know different functions the game has and the winning and losing condition to guide user's movement in the game. User operation is to instruct user's operation on the game in case it is the first time you have been exposed to this system.

Supporting System

This system is only available on MacOSX.

Game rule

[OBJECT]: The object of the game is to become the wealthiest player through buying and renting property.

[PREPARATION]: Set game player's number and names, robot player's number and difficulty level. Each player should remember his/her player number and name, which will decide the order they make movements.

[THE PLAY]: Players have money and can own properties. Each player starts with HKD 1500 and no property. All players start from the first square ("Go"). Each player in turn throws the dice by pressing "ENTER". Players take turns in rolling the dice and advancing their respective tokens clockwise on the board. After reaching square 20, a

token moves to square 1 again. After you have completed your play, the turn passes to the next one. The tokens remain on the spaces occupied and proceed from that point on the player's next turn. Two or more tokens may rest on the same space at the same time. According to the space your token reaches, you may be entitled to buy properties or obliged to pay rent, pay taxes, draw a Chance card, "Go to Jail", etc. Certain squares take effect on a player (see below) when her token passes or lands on the square. For example, they can change the player's amount of money.

["GO"]: Every time a player passes through (not necessarily lands on) this square, she gets HKD 1500 salary.

[BUYING PROPERTY]: Whenever you land on an unowned property, you can choose to buy it for the written price. The host name of the square will then change to your character's name. If you do not wish to buy the property, nothing happens, and the turn goes to the next player to roll dice and move.

[PAYING RENT]: When you land on property owned by another player, the owner collects rent from you (rent amounts are listed in Table 1).

[CHANCE]: When you land on either of these squares, you either gains a random amount (multiple of 10) up to HKD 200 or loses a random amount (multiple of 10) up to HKD 300.

[INCOME TAX]: If you land on this square, you pay 10% of your money (rounded down to a multiple of 10) as tax.

[GO TO JAIL]: If a player lands on this square, she immediately goes to the "In Jail" part of the "In Jail/Just Visiting" square. When you are sent to Jail, you cannot collect your HKD 1500 salary in that move since. Your turn ends when you are sent to Jail.

[JAIL]: You land in Jail when your token lands on the space marked "Go to Jail"

If you are not "sent" to Jail but in the ordinary course of play land on that space, you are "Just Visiting". You incur no penalty, and you move ahead in the usual manner on your next turn.

You get out of Jail by either throwing doubles (i.e., both dice coming out the same face up) on any of her next three turns (if she succeeds in doing this, she immediately moves forward by the number of spaces shown by her doubles throw) or paying a fine of HKD 150 before she rolls the dice on either of her next two turns. If the player does not throw doubles by her third turn, she must pay the HKD 150 fine. She then gets out of jail and immediately moves forward the number of spaces shown by her throw.

Even though you are in Jail, you may still collect rents.

["FREE PARKING"]: A player landing on this place does not receive any money, property, or reward of any kind. This is just a "free" resting place.

BANKRUPTCY: You are declared bankrupt if you have negative amount of money. If your debt is to another player, that player gets the required amount of money, and you lose all that you have of value and retire from the game. All your properties become unowned.

If you are bankrupt because of CHANCE square or the fine in Jail, you immediately retire from the game. All your properties become unowned.

[WIN]: The game ends either if there is only one player left or after 100 rounds. The winner is the player with the most money at the end of the game. Ties (multiple winners) are possible.

User Operation

✧ *Input Format*

After each button is pressed, user should press "ENTER" to let the operation work. All the operations below are based on this. For example, if you want to input "Tommy" as your character name, you should input "Caps lock" + "t" + "ENTER" + "Caps lock" + "o" + "ENTER" + "m" + "ENTER" + "m" + "ENTER" + "y" + "ENTER" + "ENTER".

✧ *Key Operation*

User can change their choice by pressing "W", "A", "S", "D" and then "ENTER". To be specific, "W" means up one square, "S" means down one square, "A" means left one square and "D" means right one square.

User can press "P" then "ENTER" to pause during the game.

✧ *Detailed Operation*

Menu Page

(**Menu Page**)

Once you open the game, you will come to this page.

User should press "W" or "S" and then "ENTER" to change his/her choice.
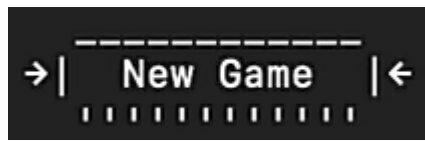
Be surrounded by the square and arrows means this option is what you are choosing right now.

Settings Page

After user choose "New Game" or choose "Continue" without save a game before, it will go to Settings Page.

(**Settings Page**)

User can press "W", "A", "S", "D" and then "ENTER" to decide the game's player number, robot number and robot level.
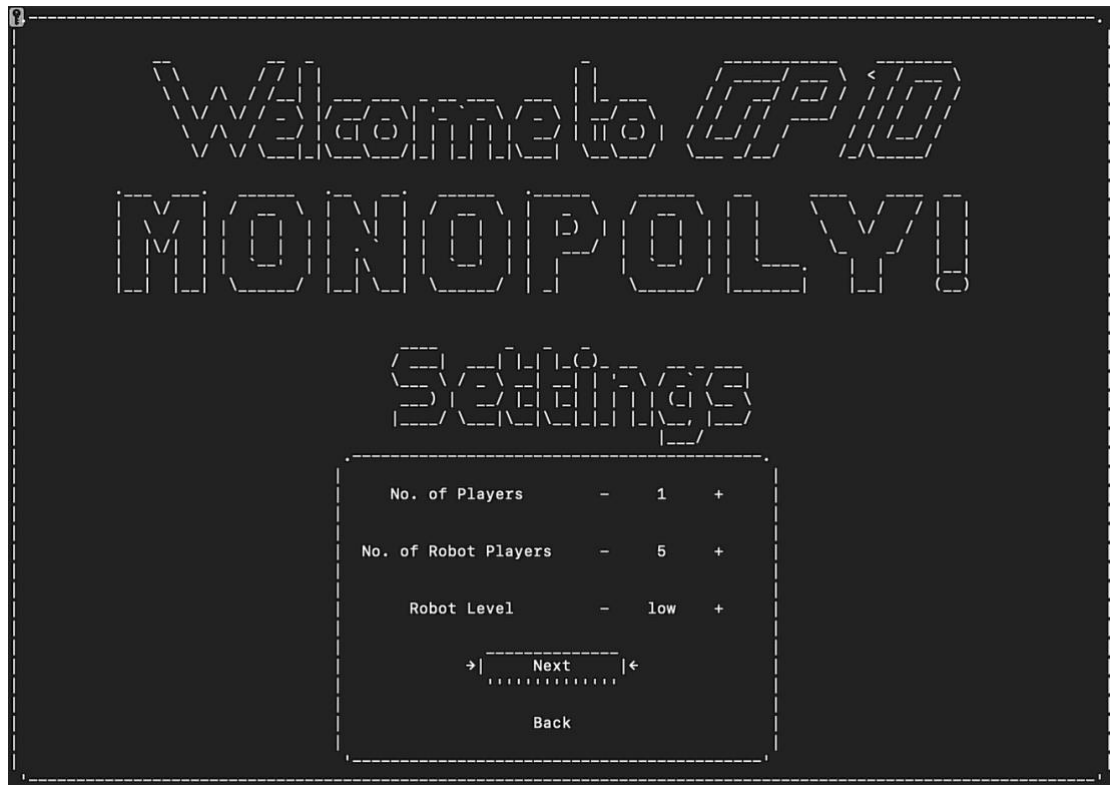
After selected, you can choose "Next" to go to the next page or "Back" to go back to the Menu Page.

After choosing "Next", you will go to the second Settings Page to set the player's names. The detailed input command is already mentioned in Input Format.

After selected, you can choose "Next" to go to the next page or "Back" to go back to the first Settings Page.

After choosing "Next" in the second Settings Page, the game starts, you will go to the Game Page.

Game Page

♦ *Gameboard*
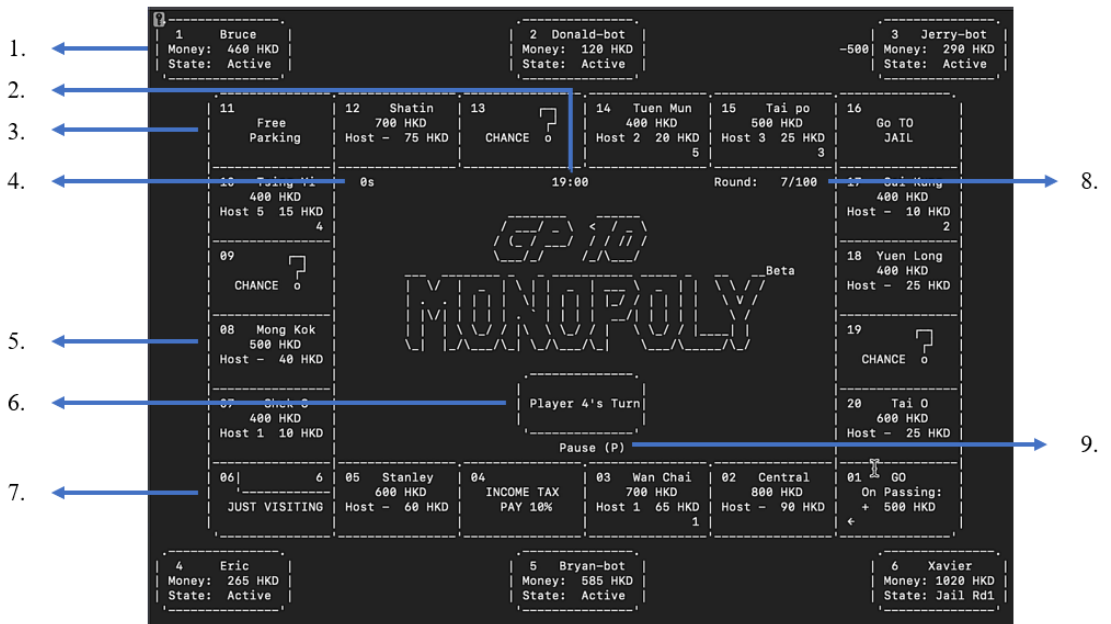
1. User Square

This square is to represent the players in the game. The upper left number represents the player number and the order to make movements. When a player is retired from the game, the number becomes "x". Next to it lies the name of the player. The money line shows the current amount of money the player has. The number also in

the money line outside the square represents the current change of money, such as paying a rent, getting a salary, etc.

The state line shows the current state of the player, which includes active, broke(bankrupt), in jail.

2. Time

Here shows the time of the real world.

3. Function Square

Function Square includes CHANCE, INCOME TAX, GO, GO TO JAIL and IN JAIL/JUST VISITING. When player lands on each of the squares, things will happen.

4. Time Limit

For each event that needs player's choice, there will be a 30 seconds' time limit for choosing. After the time limit, the system will automatically choose for you.

5. Property Square
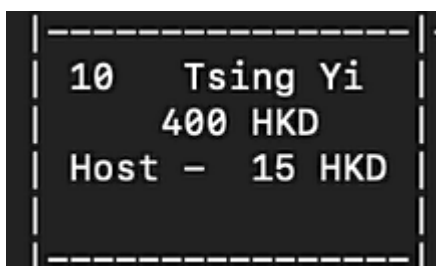
The upper left number is the square number that each square has. Next to it is the name of the property. The number in the middle is the price for buying the property. Host means the owner of the property. If no one owns it, host is "-". The last number is the rent of the property, which means it will cost a player this amount of money if a player lands on here while it is already owned by others.

Properties Table: list all properties information on gameboard

Position	Name	Price	Rent
2	Central	800	90
3	Wan Chai	700	65
5	Stanley	600	60
7	Shek O	400	10
8	Mong Kok	500	40
10	Tsing Yi	400	15
12	Shatin	700	75
14	Tuen Mun	400	20
15	Tai Po	500	25
17	Sai Kung	400	10
18	Yuen Long	400	25
20	Tai O	600	25

6. Activity Square

This square shows the current movement the system is doing.

7. Jail Square

If the player number appears on the bottom right corner of the square, it means the player is just visiting.
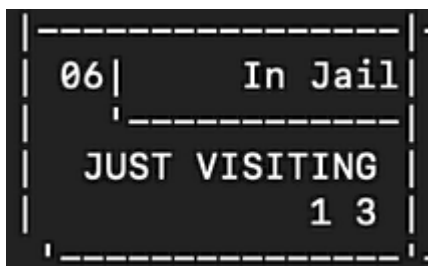
If the player number appears on the upper right corner of the square, it means the player is in jail.
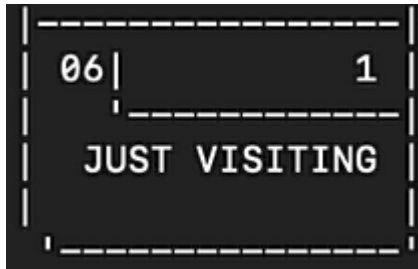
8. Round Count

Here counts the number of rounds. Once the number counts to 100, the game ends.

9. Pause

User can press "P" and then "ENTER" to pause the game.

✧ *Game Play*

After the game begins, user should press "ENTER" to roll the dice. The system will automatically roll the dice for you if you have passed the time limit.
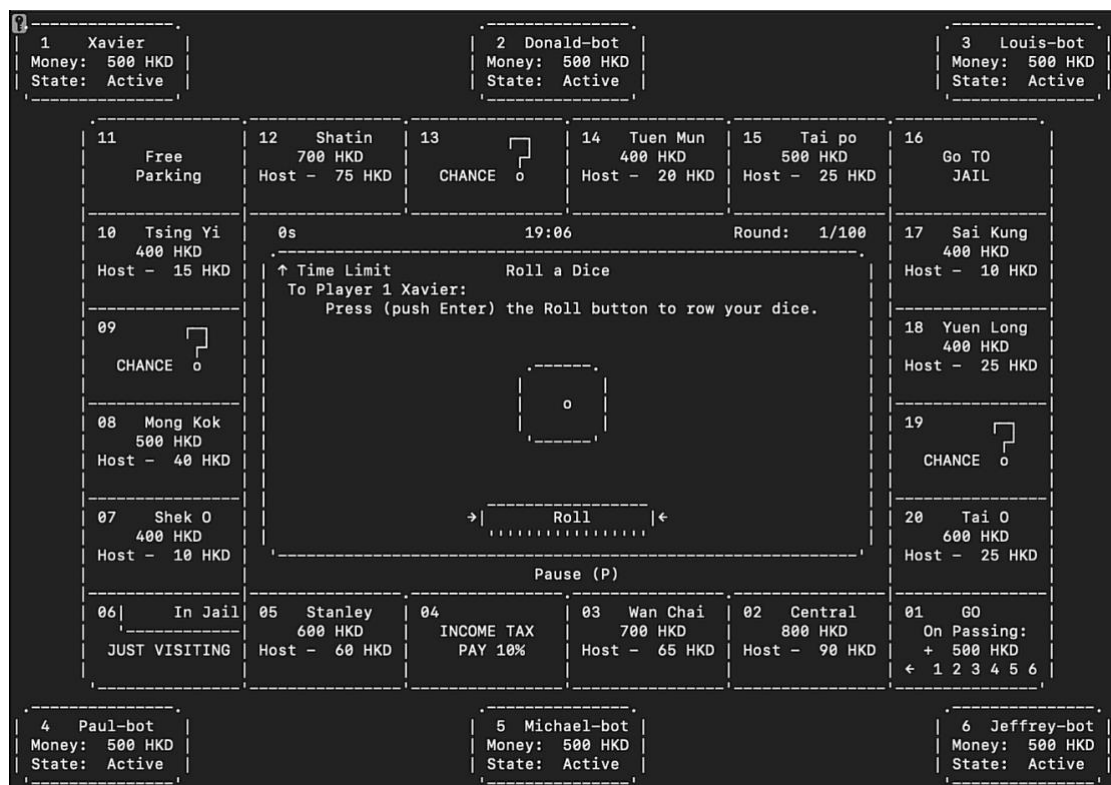
After rolling the dice, player will advance their respective tokens clockwise on the board and will thus land on different squares.

CHANCE:

```
.------------.                      .------------.                      .------------.
| 1   Xavier |                      | 2  Donald-bot |                   | 3   Louis-bot |
| Money:  500 HKD |                 | Money:  110 HKD |                 | Money:   65  HKD |
| State:  Active |                  | State:  Active |                  | State:  Active |
'------------'                      '------------'                      '------------'
    .----------------------------------------------------------------------------------------.
    | 11            | 12     Shatin | 13        ┌─┐  | 14    Tuen Mun | 15     Tai po | 16            |
    |      Free     |      700 HKD  |           |  | |      400 HKD  |     500 HKD  |    Go TO      |
    |    Parking    | Host -  75 HKD| CHANCE  o |    | Host -  20 HKD| Host -  25 HKD|    JAIL       |
    |        1 3 6  |            2  |              | |               |               |               |
    |---------------|-----------------------------------------------------------------|---------------|
    | 10   Tsing Yi | 0s                      19:09              Round:   4/100       | 17   Sai Kung |
    |      400 HKD  | .-------------------------------------------------------------.  |      400 HKD  |
    | Host 3  15 HKD| | ↑ Time Limit        CHANCE Lucky Draw                       |  | Host -  10 HKD|
    |            4  | |   To Player 5 Michael-bot:                                  |  |---------------|
    |---------------| |                    Pick one card and flip it.              |  | 18  Yuen Long |
    | 09       ┌─┐  | |                                                            |  |      400 HKD  |
    |          |  | | |                                                            |  | Host -  25 HKD|
    | CHANCE  o|    | |                                      ------                |  |---------------|
    |        5 |    | |   .-------.   .-------.   .-------.  |      |  .-------.    |  | 19       ┌─┐  |
    |---------------| |   |       |   |       |   |     | | |  | | | |       |     |  |          |  | |
    | 08  Mong Kok  | |   | ???? |   | ???? |  →| ???? |←| ???? |     |     |  CHANCE  o|    |
    |      500 HKD  | |   |       |   |       |   |     | | |  | | | |       |     |  |               |
    | Host 5  40 HKD| |   '-------'   '-------'   '-----| |  | | | '-------'     |  |---------------|
    |---------------| |                                                            |  | 20     Tai O  |
    | 07     Shek O | |              Push Enter after selection.                   |  |      600 HKD  |
    |      400 HKD  | |                                                            |  | Host -  25 HKD|
    | Host 2  10 HKD| '-------------------------------------------------------------'  |               |
    |---------------|                        Pause (P)                               |---------------|
    | 06|   In Jail| 05    Stanley | 04            | 03    Wan Chai | 02    Central | 01      GO    |
    | '-----------'|      600 HKD  |  INCOME TAX   |     700 HKD   |     800 HKD   | On Passing:   |
    |  JUST VISITING| Host -  60 HKD|   PAY 10%     | Host -  65 HKD| Host -  90 HKD| +   500 HKD   |
    |               |               |               |               |               | ←             |
    '----------------------------------------------------------------------------------------'
  .------------.                      .------------.                      .------------.
  | 4  Paul-bot |                     | 5  Michael-bot |                  | 6  Jeffrey-bot |
  | Money:  435 HKD |                 | Money:    0  HKD |                | Money:  490 HKD |
  | State:  Active |                  | State:  Active |                  | State:  Active |
  '------------'                      '------------'                      '------------'
```

If the player lands on a chance square, he/she should press "A" or "D" and then "ENTER" to select the card. After selection, all the cards will show their amount and the select amount of money will either be added or deducted from player's money.

```
.------------.                      .------------.                      .------------.
| 1   Xavier |                      | 2  Donald-bot |                   | 3   Louis-bot |
| Money:  500 HKD |                 | Money:  110 HKD |                 | Money:   65  HKD |
| State:  Active |                  | State:  Active |                  | State:  Active |
'------------'                      '------------'                      '------------'
    .----------------------------------------------------------------------------------------.
    | 11            | 12     Shatin | 13        ┌─┐  | 14    Tuen Mun | 15     Tai po | 16            |
    |      Free     |      700 HKD  |           |  | |      400 HKD  |     500 HKD  |    Go TO      |
    |    Parking    | Host -  75 HKD| CHANCE  o |    | Host -  20 HKD| Host -  25 HKD|    JAIL       |
    |        1 3 6  |            2  |              | |               |               |               |
    |---------------|-----------------------------------------------------------------|---------------|
    | 10   Tsing Yi | 0s                      19:09              Round:   4/100       | 17   Sai Kung |
    |      400 HKD  | .-------------------------------------------------------------.  |      400 HKD  |
    | Host 3  15 HKD| | ↑ Time Limit        CHANCE Lucky Draw                       |  | Host -  10 HKD|
    |            4  | |   To Player 5 Michael-bot:                                  |  |---------------|
    |---------------| |                    Pick one card and flip it.              |  | 18  Yuen Long |
    | 09       ┌─┐  | |                                                            |  |      400 HKD  |
    |          |  | | |                                                            |  | Host -  25 HKD|
    | CHANCE  o|    | |                                      ------                |  |---------------|
    |        5 |    | |   .-------.   .-------.   .-------.  |      |  .-------.    |  | 19       ┌─┐  |
    |---------------| |   |       |   |       |   |       | |  50  | | |       |     |  |          |  | |
    | 08  Mong Kok  | |   |  470  |   |  500  |  →|  430  |←| HKD | |     |  CHANCE  o|    |
    |      500 HKD  | |   |  HKD  |   |  HKD  |   |  HKD  | |  | | | |       |     |  |               |
    | Host 5  40 HKD| |   '-------'   '-------'   '-------' '------' '-------'     |  |---------------|
    |---------------| |                                                            |  | 20     Tai O  |
    | 07     Shek O | |              Push Enter after selection.                   |  |      600 HKD  |
    |      400 HKD  | |                                                            |  | Host -  25 HKD|
    | Host 2  10 HKD| '-------------------------------------------------------------'  |               |
    |---------------|                        Pause (P)                               |---------------|
    | 06|   In Jail| 05    Stanley | 04            | 03    Wan Chai | 02    Central | 01      GO    |
    | '-----------'|      600 HKD  |  INCOME TAX   |     700 HKD   |     800 HKD   | On Passing:   |
    |  JUST VISITING| Host -  60 HKD|   PAY 10%     | Host -  65 HKD| Host -  90 HKD| +   500 HKD   |
    |               |               |               |               |               | ←             |
    '----------------------------------------------------------------------------------------'
  .------------.                      .------------.                      .------------.
  | 4  Paul-bot |                     | 5  Michael-bot |                  | 6  Jeffrey-bot |
  | Money:  435 HKD |                 | Money:    0  HKD |                | Money:  490 HKD |
  | State:  Active |                  | State:  Active |                  | State:  Active |
  '------------'                      '------------'                      '------------'
```

Properties:

```
.----------------.                      .----------------.                      .----------------.
|  1      Bruce  |                      |  2   Donald-bot|                      |  3   Jerry-bot |
| Money:  340 HKD|                      | Money:  500 HKD|                      | Money:  450 HKD|
| State: Active  |                      | State: Active  |                      | State: Active  |
'----------------'                      '----------------'                      '----------------'
      .----------------.----------------.----------------.----------------.----------------.----------------.
      | 11             | 12     Shatin  | 13          ___| 14   Tuen Mun  | 15     Tai po  | 16             |
      |       Free     |      700 HKD   |            |   || 16  400 HKD   |      500 HKD   |      Go TO     |
      |     Parking    | Host -  75 HKD | CHANCE   o | Host -  20 HKD | Host -  25 HKD |      JAIL      |
      |                |             6  |           1|                |                |                |
      |----------------|----------------'----------------'----------------'----------------|----------------|
      | 10   Tsing Yi  |  0s                        18:58              Round:   4/100      | 17   Sai Kung  |
      |      400 HKD   | .---------------------------------------------------.            |      400 HKD   |
      | Host 5  15 HKD || ↑ Time Limit       Buy a Property                 |            | Host -  10 HKD |
      |             5  ||    To Player 6 Xavier:                            |            |----------------|
      |----------------||          Do you want to buy the property shown below?         | 18   Yuen Long |
      | 09          ___||                                                   |            |      400 HKD   |
      |            |   |||                                                   |            | Host -  25 HKD |
      | CHANCE   o |   ||      _ // /\          Name:      Shatin           |            |----------------|
      |----------------||     |||| ||           Prize:     700 HKD          |            | 19          ___|
      | 08   Mong Kok  ||     |||| ||           Rent:       75 HKD          |            |            |   |
      |      500 HKD   ||     |||| |||                                      |            | CHANCE   o |   |
      | Host -  40 HKD ||                                                   |            |----------------|
      |          2 3 4 ||                                                   |            | 20     Tai O   |
      |----------------||                                                   |            |      600 HKD   |
      | 07     Shek O  ||     →|     Yes    |←             No               |            | Host -  25 HKD |
      |      400 HKD   ||      ............                                 |            |                |
      | Host 1  10 HKD || '---------------------------------------------------'         |----------------|
      |----------------|                  Pause (P)                                     |                |
      |----------------|----------------|----------------|----------------|----------------|----------------|
      | 06|     In Jail| 05    Stanley  | 04             | 03   Wan Chai  | 02    Central  | 01      GO     |
      | '--------------|      600 HKD   |   INCOME TAX   |      700 HKD   |      800 HKD   |  On Passing:   |
      |   JUST VISITING| Host -  60 HKD |    PAY 10%     | Host -  65 HKD | Host -  90 HKD |  +   500 HKD   |
      |                |                |                |                |                |  ←             |
      '----------------'----------------'----------------'----------------'----------------'----------------'
.----------------.                      .----------------.                      .----------------.
|  4      Eric   |                      |  5   Bryan-bot |                      | →6←   Xavier   |
| Money:  440 HKD|                      | Money:  590 HKD|                      | Money:  780 HKD|
| State: Active  |                      | State: Active  |                      | State: Active  |
'----------------'                      '----------------'                      '----------------'
```

When a player lands on a property square, he/she should press "A" and "D" to decide whether to buy the property. If he/she choose to buy, the property's host then becomes his/her name.

Go to Jail:

```
.----------------.                      .----------------.                      .----------------.
|  1      Bruce  |                      |  2   Donald-bot|                      |  3   Jerry-bot |
| Money:  460 HKD|                      | Money:  140 HKD|                      | Money:  315 HKD|
| State: Active  |                      | State: Active  |                      | State: Active  |
'----------------'                      '----------------'                      '----------------'
      .----------------.----------------.----------------.----------------.----------------.----------------.
      | 11             | 12     Shatin  | 13          ___| 14   Tuen Mun  | 15     Tai po  | 16             |
      |       Free     |      700 HKD   |            |   ||      400 HKD   |      500 HKD   |      Go TO     |
      |     Parking    | Host -  75 HKD | CHANCE   o | Host 2  20 HKD | Host 3  25 HKD |      JAIL      |
      |                |                |           |                |             4  |                |
      |----------------|----------------'----------------'----------------'----------------|----------------|
      | 10   Tsing Yi  |  0s                        19:01              Round:   8/100      | 17   Sai Kung  |
      |      400 HKD   | .---------------------------------------------------.            |      400 HKD   |
      | Host 5  15 HKD || ↑ Time Limit          In Jail                     |            | Host -  10 HKD |
      |----------------||    To Player 5 Bryan-bot:                         |            |----------------|
      | 09          ___||          Do you want to Rall Dice or Post Bail?   |            | 18   Yuen Long |
      |            |   |||                                                   |            |      400 HKD   |
      | CHANCE   o |   ||                                                   |            | Host -  25 HKD |
      |             6  ||       _____                                 |            |          2 3   |
      |----------------||      | | | | |                                    |            |----------------|
      | 08   Mong Kok  ||      | | | | |    Bail:  150 HKD                  |            | 19          ___|
      |      500 HKD   ||      | | | | |                                    |            |            |   |
      | Host -  40 HKD ||      |_|_|_|_|                                    |            | CHANCE   o |   |
      |----------------||                                                   |            |----------------|
      | 07     Shek O  ||    Roll Dice          →|    Post Bail   |←        |            | 20     Tai O   |
      |      400 HKD   ||                        ................          |            |      600 HKD   |
      | Host 1  10 HKD || '---------------------------------------------------'         | Host -  25 HKD |
      |             1  |                  Pause (P)                                     |                |
      |----------------|----------------|----------------|----------------|----------------|----------------|
      | 06|         5  | 05    Stanley  | 04             | 03   Wan Chai  | 02    Central  | 01      GO     |
      | '--------------|      600 HKD   |   INCOME TAX   |      700 HKD   |      800 HKD   |  On Passing:   |
      |   JUST VISITING| Host -  60 HKD |    PAY 10%     | Host 1  65 HKD | Host -  90 HKD |  +   500 HKD   |
      |                |                |                |                |                |  ←             |
      '----------------'----------------'----------------'----------------'----------------'----------------'
.----------------.                      .----------------.                      .----------------.
|  4      Eric   |                      |  5   Bryan-bot |                      |  6    Xavier   |
| Money:  220 HKD|                      | Money:  585 HKD|                      | Money: 1020 HKD|
| State: Active  |                      | State: Jail Rd1|                      | State: Active  |
'----------------'                      '----------------'                      '----------------'
```

When a player lands on the go to jail square, he/she then is sent to in jail square and his/her number appear on the square, his/her state becomes in jail. He/She should press "A" and "D" to decide whether to roll dice or pay a fine of HKD 150.
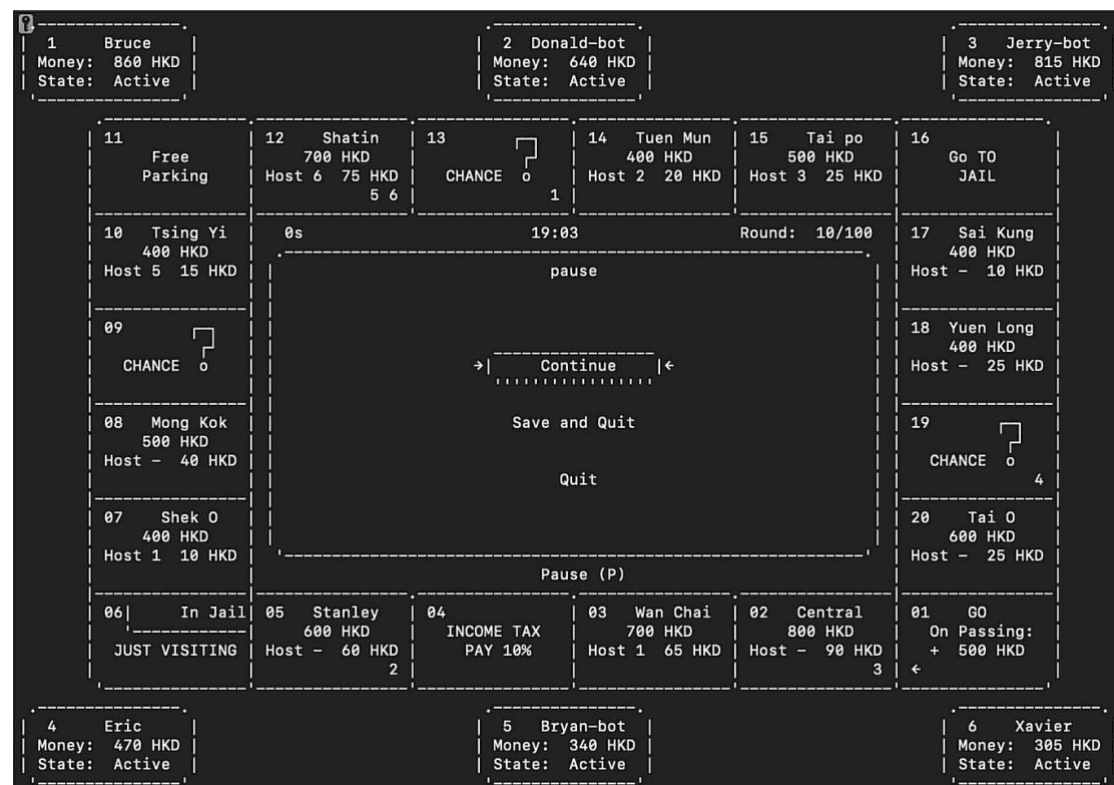
Income Tax:

When a player lands on the Income Tax square, his/her 10% of her money (rounded down to a multiple of 10) will be deducted.

GO:

Every time a player passes through (not necessarily lands on) this square, she gets HKD 1500 salary.

Pause Page:


```
.---------------.                        .---------------.                               .---------------.
| 1    Bruce    |                        | 2   Donald-bot|                               | 3   Jerry-bot |
| Money:  860 HKD|                       | Money:  640 HKD|                              | Money:  815 HKD|
| State: Active |                        | State: Active |                               | State: Active |
'---------------'                        '---------------'                               '---------------'
      .-----------.-----------.-----------.-----------.-----------.-----------.
      | 11        | 12  Shatin| 13        | 14  Tuen Mun| 15   Tai po| 16       |
      |   Free    |   700 HKD |        ⌐  |   400 HKD |   500 HKD |   Go TO   |
      |  Parking  | Host 6  75 HKD| CHANCE  o | Host 2  20 HKD| Host 3  25 HKD|   JAIL    |
      |           |         5 6|        1  |           |           |          |
      | 10  Tsing Yi| 0s                    19:03                   Round: 10/100| 17  Sai Kung|
      |   400 HKD |  .------------------------------------------------------.  |   400 HKD |
      | Host 5  15 HKD| |                         pause                        |  | Host -  10 HKD|
      |           | |                                                      |  |          |
      | 09        | |                                                      |  | 18  Yuen Long|
      |        ⌐  | |                 .---------------.                    |  |   400 HKD |
      | CHANCE  o | |               →|    Continue    |←                   |  | Host -  25 HKD|
      |           | |                 '''''''''''''''''                    |  |          |
      | 08  Mong Kok| |                   Save and Quit                      |  | 19       |
      |   500 HKD | |                                                      |  |        ⌐ |
      | Host -  40 HKD| |                      Quit                           |  | CHANCE  o|
      |           | |                                                      |  |        4 |
      | 07   Shek O| |                                                      |  | 20   Tai O|
      |   400 HKD | |                                                      |  |   600 HKD |
      | Host 1  10 HKD| '------------------------------------------------------'  | Host -  25 HKD|
      |           |                        Pause (P)                            |          |
      | 06|   In Jail| 05  Stanley| 04        | 03  Wan Chai| 02  Central| 01    GO |
      | '----------|   600 HKD | INCOME TAX|   700 HKD |   800 HKD | On Passing:|
      | JUST VISITING| Host -  60 HKD|  PAY 10% | Host 1  65 HKD| Host -  90 HKD| +  500 HKD|
      |           |          2|           |           |          3| ←        |
      '-----------'-----------'-----------'-----------'-----------'-----------'
.---------------.                        .---------------.                               .---------------.
| 4    Eric     |                        | 5   Bryan-bot |                               | 6    Xavier   |
| Money:  470 HKD|                       | Money:  340 HKD|                              | Money:  305 HKD|
| State: Active |                        | State: Active |                               | State: Active |
'---------------'                        '---------------'                               '---------------'
```

User should press "W" and "S" to change his/her choice, either to continue, save and quit or quit.

Rank Page:

```
.----------------------------------------------------------.
|                      Ranking List                        |
|                                                          |
|    No.    Id       Name        Money      Property No.   |
|     1      1        Bruce      860HKD              2      |
|     2      3     Jerry-bot     815HKD              1      |
|     3      2    Donald-bot     640HKD              1      |
|     4      4         Eric      470HKD              0      |
|     5      5     Bryan-bot     340HKD              1      |
|     6      6       Xavier      305HKD              1      |
|                                                          |
|                                                          |
|                                                          |
|                                                          |
|                   ----------------                       |
|              →|     Go to Menu      |←                   |
'_____    ''''''''''''''''''''     _____.'
```

When user pauses the game and quits or the game ends, the Rank Page will show.

User can press "ENTER" to go back to Menu Page.

Error message

When user enters valid inputs in the game, nothing will happen, and game process keep going smoothly. However, error message will emerge if user enter invalid number towards setting of players or input a relative long player name contained a great deal of characters. Please see detail constrained cases below for reference:

Constrain case 1: Number of player cannot be set more than 2, otherwise error message will display (please see demo for details).

Constrain case 2: Each player's name is not allowed to contain characters exceed 10, otherwise error message will display (please see demo for details)..

Developer Manual

System Requirements:
- ✓ Java JDK Version: 16 (source 15) (14 will fail due to not supporting **string box**)
- ✓ IntelliJ Idea Version: >=2020
- ✓ Operating System: OS X 11(Big Sur), 12(Monterey) on both X86-64, ARM64
- ✓ In theory Ubuntu works, but never tested.

How to Run?
1. Open terminal and switch the working direction to folder /MonopolyGP10
2. Enter

   java -cp out/production/monopolyGP10 monopoly.Controller.Main

3. **Please resize the terminal window to suitable before play.**
4. Please do not use Idea Console to run this game, the KeyboardListener will failed!
5. Use either terminal or idea inner terminal. zsh is highly recommended.
6. Please do set the working Dir of the terminal to folder /MonopolyGP10, or the saver and loader won't work.

How to compile?
1. Open the Project Folder "MonopolyGP10" through Idea.
2. Click button "Build" (The Hammer on the left of Debugging Configuration)
3. Do steps in "How to Run?"
4. The compiled .class files are built on ARM64 machine, if your Mac is X86 arch, please build it by yourself before running.
5. If you wish to make the procedure of the game faster, you can change the values in Pkg monopoly.model.configs. For instance:
   i. waitForSelectionTime: controls the time of waiting for user operations. At after waiting of user operation, once the timer end, the game will help the user to make decision.
   ii. robotPendingTime: controls the time of delay of robot operations, if set to 0, it is possible cannot see the dialog boxes.
   iii. messageOccupyTime: controls the message bar appearing time, if set to 0, you cannot the message bar.
   iv. More detail in the comments of configs.java.
   v. We have adjusted the value to the best experience of the game. We do not guarantee the game runs without any trouble after changing the values.

API Design Revision Document

Project Group 10

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During the implementation of the API design, we have tried several attempts of distinct functions. Therefore, we have changed a lot to fix some problems and get the best fitted codes. Following contents are java files and three main (modules)directories: ***Controller, View, and Model*** in source code of monopoly game project, and a table of public functions we revised. Noticed that the "*No change*" mean that they are reserved and are not revised, "+" indicated the java public class or public function that was added while "-" denoted the java public class or public function which was removed.

Java file	Function Details	Reason of change
*Directory of **Controller***		
Main	*No change*	*No change*
GlobalController	+onStart(): void -gameStart(): void -gameLoad(): void -gameSave(): void -setting(): void -globalQuit(): void	Simplify the name.
GameController	+gameStart(): int -getChanceCard(): void	They are set to private and not used as a regular API, GameController use them by

	-pause(): void	itself.
	-quit(): void	
	-pause(): void	
	-buyProperty(): void	
	-payTax(): void	
	-goJail(): void	
	-InJail(): void	
	-visitJail(): void	
	-freeParking(): void	
	-go(): void	
	-updateRoundInfo(): void	
	-makeMove(): void	
	-squareOperation(): void	

	Directory of Model	
ChanceSquare	+ChanceSquare()	The constructor.
Configs	-loadSquares(): void	Rmove Use less methods
	-getSquareBackends(): void	
DBAcessor	+DBAcessor()	Rewrite the class by using another storing
	+loadAllData()	method.
	+saveAllData(): void	
Dice	+rollDice(): int	Generate the dice random number
FreeParkingSquare	*No change*	*No change*
+GoSquare	+GoSquare()	Constructor
GoToJailSquare	*No change*	*No change*
-HistoryGame		Remove useless class
InJailOrJustVisitingSuare	*No change*	*No change*
InPrisonState	*No Change*	No Change
IncomeTaxSquare	*No change*	*No change*

Player	+ifBuy(): boolean	Add all needed data storing and operation methods
	+isReleaseOnBail(): Boolean	
	+chooseCard(): int	
	+isBankrupt(): Boolean	
	+setBankrupt(): void	
	+updateInPrison(): void	
	+getPrisonState(): InPrisonState	
	+setMoney (): void	
	+getMoney(): int	
	+getNameString(): String	
	+getPositionID(): int	
	+getPropertyNumber(): int	
	+setPropertyIds(): void	
	+getPropertyIds():ArrayList<Intege	
	+setRobot(): void	
	+isRobot(): Boolean	
	+getRobotLevel(): int	
	+setRobotLevel: void	
	-rollDice(): void	
	-addProperty(): void	
	-changePositionID(): void	
Property	+getRent(): int	Add getter and setter
	+getHostID(): int	
SquareBackend	+getPrice(): int	Add all needed data storing and operation methods
	+getRent(): int	
	+hasHost(): Boolean	
	+getHostID(): int	
	+setHostID(): void	
	+luckyDraw(): int[]	

SquareType	*No change*	*No change*
+StaticToolMethods	+StaticToolMethods() +randomNameGenerator(): String +playersGenerator(): Player[]	Tool methods for generator random nam Player Class

	Directory of View	
+Button	+Button() +setSelectionIssue(): void +setText(): void +appendText(): void +getText(): String +backSpace(): void +getTextLen(): int +setSelected(): void +setUnselected(): void	Button for to iterate with players and display to players
+Card	+Card() +setSelected(): void +setUnselected(): void +flip(): void	**The lucky draw card for Chance square**
+Dice	+Dice() +animation(): void +setDiceNumber(): void	**The dice interface with spots (1,2,3,4)**
+DoubleDiceBox	+DoubleDiceBox() +listenOnSelection(): int +rollDice(): void	**The two dice interface for players to row**
GamePage	+Gamepage() +setPaused(): void +pauseReleased(): void +setTerminated(): void +waitForPause(): Boolean	**The main page of the game including** **players squares …** **All game related interfaces are controlled** **by this class**

	+setTimer(): void	
	+setPlayerBarSelected(): void	
	+setPlayerBarUnselected(): void	
	+upDatePlayerBar(): void	
	+setAllPlayerPositions(): void	
	+displaySingleDiceBox(): int	
	+displayDoubleDiceBox(): int	
	+displayPropertyAskBox(): int	
	+displayLuckyDrawBox(): int	
	+displayInJailAskBox(): int	
	+displayRanListBox(): int	
	+displayPauseBox(): int	
	+setHost(): void	
	+makeMovement(): void	
	+goToJailMove(): void	
	+setOutOfJail(): void	
	+setRound(): void	
	+terminateStateBar (): void	
	+removePlayer(): void	
	+clearHost(): void	
	+roundMessage(): void	
	+turnsMessage(): void	
	+dealDoneMessage(): void	
	+goJailMessage(): void	
	+brokeMessage(): void	
	+releasedMessage(): void	
	+failedMessage(): void	
+InJailAskBox	+InJailAskBox() +listenOnSelection(): int	**Ask the player whether row 2 dice or pay fine.**

	+OnSelection(): void	
+InJailFront	+InJailFront() +addPlayer(): void +removePlayer(): void	**The label to display in jail players**
+InputField	+InputField(): +setSelected(): void +setUnselected(): void +fieldAppendText(): void	**For user to input the name their want**
KeyboardListener	+setStop(): void +listenToPause(): void +setUnPause(): void +listenCharInputOnPause(): Char +listenCharInput(): Char +clearCurrentListenMethods(): void +clearAllCurrentListenMethods(): void +clear(): void +run(): void -SequenceListener(): String -listenSingleKey(): Char	**The keyboard listener for user key inputs**
+Label	+Label() +setLayout(): void +setText(): void +appendText(): void +backSpace(): void +getTextLen(): int	**The word display class on game interface**
+LuckyDrawBox	+LuckyDrawBox() +listenOnSelection(): int +OnSelection(): void	**The lucky draw intereface for players to choose one.**

	+display(): void	
+MainPage	+MainPage() +getPlayerNames(): String[] +getPlayerNumber(): int +getRobotLevel(): int +MoveToSettingPage1(): void +MoveToSettingPage2(): void +MoveToMenuPage(): void +displayUserManual(): void +listenOnSelection(): int	**The menu, setting, user manual page.**
MenuPage	+listenOnSelection(): int	**The manual selections**
+MessageBar	+MessageBar() +roundBegins(): void +playerTurn(): void +dealIsDone(): void +goToJail(): void +broke(): void +released(): void +failed(): void	**To report states to avoid getting players in confused**
+PauseBox	+PauseBox() +listenOnSelection(): int +setStop(): void +run(): void	**Displayed when pause entered**
PlayerBar	+setSelected(): void +setUnselected(): void +updateMoney(): void +updateState(): void -setPosition(): void -setMoney(): void	**The state bar of players including name id money and state**

	-setBroke(): void	
+PreLoadModels	+PreLoadModels()	**load game interfaces in ahead**
+PropertyAskBox	+PropertyAskBox() +listenOnSelection(): int +OnSelection(): void	**Ask whether a property**
RankListBox	+listenOnSelection(): int -display(): void	**Showing the rank list of the players when game ends**
SelectionPage	*No change*	*No change*
+SettingNamePage	+SettingNamePage() +setPlayerNumber(): void +getPlayerNames(): String[] +listenOnSelection(): int +resetSelection(): void	**For users to setting names they like**
+SettingNumberPage	+SettingNumberPage() +listenOnSelection(): int +resetSelection(): void +getPlayerNumber(): int +getRobotLevel(): int	**For users to setting user numbers**
+SingleDiceBox	+SingleDiceBox() +listenOnSelection(): int +rollDice(): void	
+SquareFront	+SquareFront() +clearHost(): void +setHost(): void +passBy(): void +addPlayer(): void +removePlayer(): void	
StateBar	+setRound(): void +setStop(): void	**The time count down, time and round number**

	+run(): void	
	-counter(): int	
	-updateRound(): void	
+Timer	+Timer()	**The timer to get time and count down tim**
	+getTimeLeft(): String	
	+timerStart(): void	
	+isCountDownTerminated(): Boole	
	+stopCountDown(): void	
	+setPaused(): void	
	+releasePause(): void	
	+setStop(): void	
	+run(): void	
	+getTime(): String	
+UserManual	+UserManual()	**The user manual interface**
	+listenOnSelection(): int	
Widget	+initialContent(): void	**The basic component of our interfacce**
	+getChildComponents():ArrayList< Widget>	
	+addChildComponent(): void	
	+removeChildComponent(): void	
	+clear(): void	
	+update(): char[][]	
	+isChanged(): Boolean	
	+setContent (): void	
	+listenOnSelection(): int	
	+getContent(): char[][]	
	+getWidth(): int	
	+getHeight(): int	
	+getX(): int	

	+getY(): int	
Window	+update(): void +run(): void +setStop(): void +listenOnSelection(): int +goToGamePage(): void +goToMenuPage(): void +printContent(): void	**The window for refreshing**
-ChanceBar -CountDownTimer -DiceCastor -NmaeInputPage -PausePage -Pixel -SettingPage -SquareUI		These previous defined modules and java classes are not involved in final version of the monopoly project, to simplify the codes and reduce redundant segment of unused parts and adapt to new version, in order to make project robust.