

## Design

### a. Strategy for guessing:

1. Create a list with every 4-digit numbers which have no repeated digits.
2. You pick the first number to be your guessing number.
3. You ask the users to input the correct m and the exact number n
4. Since the true secret number must have m correct numbers and n exact numbers compared with the guessing number, therefore we leave only the numbers in the list which satisfy the description.
5. Do the above steps repeatedly until the correct and exact numbers are both 4.

### b. Core data structure

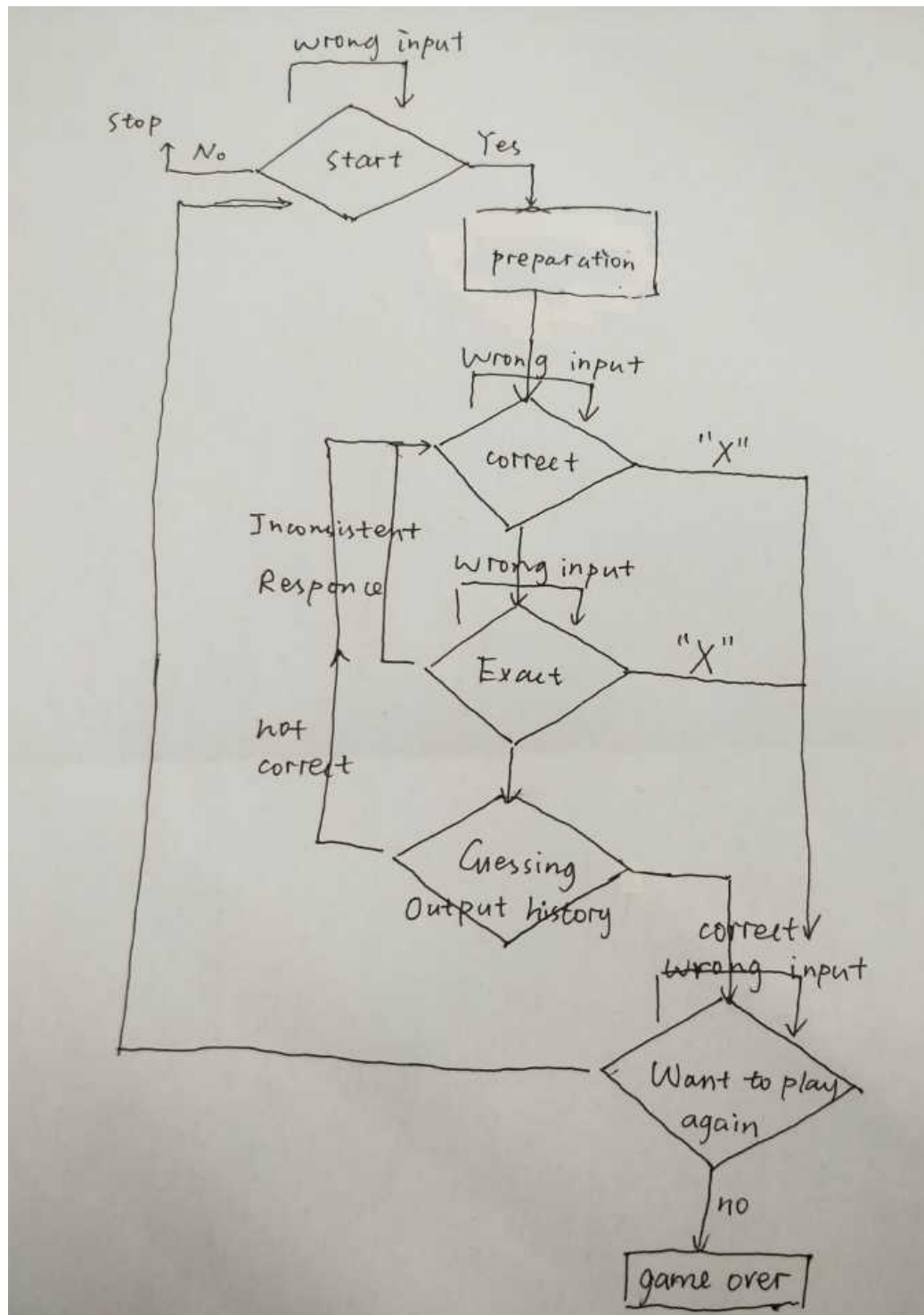
1. You create a variable "cnt" to save the time of guessing.
2. You put every detail about one guess into a list.
3. And put the lists about each game into a bigger list named history.
4. When you finished each guess you print the detail in each list which is in the history list.

### c. structure of the program

Function:

1. The start function:  
In which you ask the players if they want to play the game or not.  
Variables: gchoic\_1
2. The preparation function:  
In which you create a list with every 4-digit numbers which have no repeated digits.  
Variable: glst, glst\_prepare, ghistory, number
3. The run function:  
(1) You ask the player to input the correct and  
(2) You remove every numbers in the list which don't satisfy the description.  
Variable: gcorrect, gexact, ginitial\_number, recover, judge, exact\_real, correct\_real, initialNumber\_to\_contrast, number\_to\_contrast
4. The main function:  
Connect the above functions you finish one guessing game and ask them if they want to play again when the game is over.  
Variable: gchoice, gcnt
5. The loop function:  
Start the program if the player choose to play the game.  
Stop the program if the player doesn't want to play the game.  
Replayed the program if the player want to play again.  
Stop the program if the player doesn't want to play again.

Flow:



### Test Strategy:

#### a. Verify per scope:

1. Start function:  
Entered anything neither N nor Y.
2. Run function:  
Correct number:

- (1) Enter the correct number bigger than 4
- (2) Enter the correct number which is not positive integer (letter, characters, flow points and negative numbers)
- (3) Enter the correct number which is impossible (repeatedly)
- (4) Enter "X"
- (5) Enter proper number
- (6) Enter 0

Exact number:

- (1) Enter the exact number bigger than 4
- (2) Enter the exact number which is not positive integer
- (3) Enter the exact number which is bigger than correct number
- (4) Enter the exact number which is impossible (repeatedly)
- (5) Enter "X"
- (6) Enter proper number

### 3. Main function:

- (1) Enter characters neither n nor y

### b. Different plans

#### 1. Start function:

- (1) Print enter either N or Y continuously until player enter the proper information.
- (2) Stop the program if it is N
- (3) Start the program if it is Y

```
This is the guessing game of 4-digit numbers.
Please choose a 4-digit secret number with no repeated digits.
Please press 'X' if you want to end the program.
Do you want to play the game or not N/Y: hi
Please enter 'N' or 'Y'
Do you want to play the game or not N/Y: 0.1
Please enter 'N' or 'Y'
Do you want to play the game or not N/Y: 11
Please enter 'N' or 'Y'
Do you want to play the game or not N/Y: Y

Guess 1 /40 : 1023
How many correct digits?
```

```
This is the guessing game of 4-digit numbers.
Please choose a 4-digit secret number with no repeated digits.
Please press 'X' if you want to end the program.
Do you want to play the game or not N/Y: N

The game is over
```

#### 2. Run function:

Correct number:

- (1) Continuously ask the player to enter the correct number and indicate the error

- (2) Skip the step of input exact number if correct number is 0
- (3) Stop the whole program if X
- (4) Jump to the step of input the exact number if input is proper

```
This is the guessing game of 4-digit numbers.
Please choose a 4-digit secret number with no repeated digits.
Please press 'X' if you want to end the program.
Do you want to play the game or not N/Y: Y

Guess 1 /40 : 1023
How many correct digits?hi
It must be a positive integer

How many correct digits?-2
It must be a positive integer

How many correct digits?0.2
It must be a positive integer

How many correct digits?5
The number should no more than 4

How many correct digits?$$
It must be a positive integer

How many correct digits?0

Guess 1 /40 : 1 correct : 0 exact : 0
Guess 2 /40 : 4567
How many correct digits?
```

```
This is the guessing game of 4-digit numbers.
Please choose a 4-digit secret number with no repeated digits.
Please press 'X' if you want to end the program.
Do you want to play the game or not N/Y: Y

Guess 1 /40 : 1023
How many correct digits?X
The game is over

Start a new game (y/n)?y
This is the guessing game of 4-digit numbers.
Please choose a 4-digit secret number with no repeated digits.
Please press 'X' if you want to end the program.
Do you want to play the game or not N/Y: Y

Guess 1 /40 : 1023
How many correct digits?3
How many exact digits?X
The game is over

Start a new game (y/n)?
```

Exact number:

- (1) Continuously ask the player to enter the exact number and indicate the error
- (2) Stop the whole program if X
- (3) Jump to the next step if input is proper
- (4) Jump back to the step of input the correct number if there's no numbers left in the list

```
This is the guessing game of 4-digit numbers.  
Please choose a 4-digit secret number with no repeated digits.  
Please press 'X' if you want to end the program.  
Do you want to play the game or not N/Y: Y
```

```
Guess 1 /40 : 1023  
How many correct digits?3  
How many exact digits?5  
Exact digits should be no more than 3
```

```
How many exact digits?4  
Exact digits should be no more than 3
```

```
How many exact digits?-1  
It must be a positive integer
```

```
How many exact digits?0.2  
It must be a positive integer
```

```
How many exact digits?$$  
It must be a positive integer
```

```
How many exact digits?hi  
It must be a positive integer
```

```
How many exact digits?
```

```
This is the guessing game of 4-digit numbers.  
Please choose a 4-digit secret number with no repeated digits.  
Please press 'X' if you want to end the program.  
Do you want to play the game or not N/Y: Y
```

```
Guess 1 /40 : 1023  
How many correct digits?3  
How many exact digits?X  
The game is over
```

```
Start a new game (y/n)?n  
The game is over
```

```

This is the guessing game of 4-digit numbers.
Please choose a 4-digit secret number with no repeated digits.
Please press 'X' if you want to end the program.
Do you want to play the game or not N/Y: Y

Guess 1 /40 : 1023
How many correct digits?1
How many exact digits?1

Guess 1 /40 : 1 correct : 1 exact : 1
Guess 2 /40 : 1456
How many correct digits?1
How many exact digits?1

Guess 1 /40 : 1 correct : 1 exact : 1
Guess 2 /40 : 1 correct : 1 exact : 1
Guess 3 /40 : 1789
How many correct digits?1
How many exact digits?1
Inconsistent response

How many correct digits?1
How many exact digits?1
Inconsistent response

How many correct digits?1
How many exact digits?1
Inconsistent response

How many correct digits?1
How many exact digits?1
Inconsistent response

How many correct digits?

```

### 3. Main function:

- (1) Continuously ask the player to enter y or n until he enter properly
- (2) Stop the loop function if n
- (3) Restart the loop function fi y

```
This is the guessing game of 4-digit numbers.
Please choose a 4-digit secret number with no repeated digits.
Please press 'X' if you want to end the program.
Do you want to play the game or not N/Y: Y

Guess 1 /40 : 1023
How many correct digits?3
How many exact digits?1

Guess 1 /40 : 1 correct : 3 exact : 1
Guess 2 /40 : 1204
How many correct digits?1
How many exact digits?1
Inconsistent response

How many correct digits?3
How many exact digits?3

Guess 1 /40 : 1 correct : 3 exact : 1
Guess 2 /40 : 1 correct : 3 exact : 3
Guess 3 /40 : 1205
How many correct digits?2
How many exact digits?2

Guess 1 /40 : 1 correct : 3 exact : 1
Guess 2 /40 : 1 correct : 3 exact : 3
Guess 3 /40 : 1 correct : 2 exact : 2
Guess 4 /40 : 1234
How many correct digits?4
How many exact digits?4

Congratulations!!Start a new game (y/n)?abc
Please enter 'n' or 'y'
Congratulations!!Start a new game (y/n)?y
This is the guessing game of 4-digit numbers.
Please choose a 4-digit secret number with no repeated digits.
Please press 'X' if you want to end the program.
Do you want to play the game or not N/Y:
```

This is the guessing game of 4-digit numbers.  
Please choose a 4-digit secret number with no repeated digits.  
Please press 'X' if you want to end the program.  
Do you want to play the game or not N/Y: Y

Guess 1 /40 : 1023  
How many correct digits?3  
How many exact digits?1

Guess 1 /40 : 1 correct : 3 exact : 1  
Guess 2 /40 : 1204  
How many correct digits?3  
How many exact digits?3

Guess 1 /40 : 1 correct : 3 exact : 1  
Guess 2 /40 : 1 correct : 3 exact : 3  
Guess 3 /40 : 1205  
How many correct digits?2  
How many exact digits?2

Guess 1 /40 : 1 correct : 3 exact : 1  
Guess 2 /40 : 1 correct : 3 exact : 3  
Guess 3 /40 : 1 correct : 2 exact : 2  
Guess 4 /40 : 1234  
How many correct digits?4  
How many exact digits?4

Congratulations!!Start a new game (y/n)?n  
The game is over