

Mini-project 4: Master mind game

Read the program information; fill in the blanks and draw class diagrams, interaction diagrams (sequence diagrams and/or communication diagrams) for the program.

Notes:

- The below source code is the suggestion, you can freely re-design and re-write the source code. However, in the case of modification, please provide your explanations and reasons for that
- You should enhance the main method with different scenarios so that it can call all necessary methods of other classes
- You may draw several interaction diagrams. Note that the flow of them may illustrate for:
 - the main method and similar scenarios calling other methods
 - complicated methods of some classes (if any)

Submission: Please send email to trangntt@soict.hust.edu.vn before 1 day of the UML3 class.

- Subject: [Bxx-TSDV-Miniproject] Submission of Miniproject – NguyenVanAn
 - where Bxx is your batch (e.g. B61), NguyenVanAn is your fullname
- Create a folder with your full name and miniproject number, e.g. NguyenVanAn-MP4. Then put the below resources to that folder, compress to a zip file and attach to the email:
 - AnswersForBlanks.txt: Includes your answer for blanks in programs
 - Astah file for class diagrams and interaction diagrams
 - Picture files for class diagrams and interaction diagrams
 - SourceCode folder: export your project to an archive file and put it in this folder.

[Program Description]

Rule of the game is as follows: the program generates 4 digits random number, but the program doesn't show the number. You need to guess the hidden number by reaching the correct answer within specified attempts.

In each guess, the program evaluates your guess and the hidden number and gives you hint for the next guess. As shown in Figure 1, if a digit you guessed appears in the hidden number at the same position, the program displays '*'. If a digit you guessed appears in the hidden number but at the different position, the program displays '!'.

Your guess	3	4	5	6
Hidden number	2	4	6	8
Output		*	!	

Figure 1. Example of the master mind game.

At the start of the game, the program automatically generates the number as a secret. You have to enter your guess and the response follows. A sample output is shown in Figure 2.

```

Please Guess four Hidden Digits
Enter Your Guess: 4567
*
Enter Your Guess: 4576
*
Enter Your Guess: 3487
!!
Enter Your Guess: 4387
*!
Enter Your Guess: 4873
**
Enter Your Guess: 4573
*
Enter Your Guess: 4856
**
Enter Your Guess: 4849
**
YOU LOST
CORRECT ANSWER IS 4801

```

Figure 2. Sample output of the program.

[Program 1]

```

import java.util.*;
public class MasterMind {
    private static int defaultmaxAllowTime = 8;
    private static int QUIZZ_LENGTH = 4;
    private static char allCorrect='*';
    private static char numberCorrect='!';
    public enum State {PROGRESS, LOST, WIN }

```

```

private String hiddenNumber;
private State gameState;
private int maxAllowTime;
private List<Answer> attemptList;
private String correctAnswer = new String();

public MasterMind() {
    gameState = State.PROGRESS;
    hiddenNumber = generateHiddenNumber();
    maxAllowTime = defaultmaxAllowTime;
    for(int i=1;i<= QUIZZ_LENGTH;i++){
        correctAnswer = correctAnswer + allCorrect;
    }
    attemptList = new ArrayList<Answer>();
}

public String getHiddenNumber(){
    return hiddenNumber;
}

public boolean isProgress(){
    return GameState==State.PROGRESS;
}

public boolean isGameOver(){
    return GameState==State.LOST;
}

public boolean isWon(){
    return GameState==State.WIN;
}

private String generateHiddenNumber(){
    Random rand = new Random();
    return String.format("%04d", rand.nextInt(10000));
}

public String getResult(){
    A ;
    return ans.getResult();
}

public void evaluateResult(Answers Ans){
    if ( B ){
        Ans.setResult(matchResult(Ans.getAnswer()));
        this.attemptList.add(Ans);
    }
}

```

```

        changeGameStatus (Ans);
    }
    private void changeGameStatus (Answers paraAttmpt) {
        if (attemptList.size() < maxAllowTime) {
            if ( C )
                gameState=State.WIN;
            } else
                gameState = State.LOST;
        }
    public String matchResult (String inputNumber) {
        char[] inChar;
        char[] hidChar;
        String rtnValue = new String();
        inChar = inputNumber.toCharArray();
        hidChar = hiddenNumber.toCharArray();
        for (int i=0; i < hiddenNumber.length(); i++) {
            if (inChar[i]==hidChar[i]) {
                //mark the character is already used
                inChar[i] = '#';
                rtnValue= rtnValue + this.allCorrect;
            } else
                for (int j=0; j < hiddenNumber.length(); j++) {
                    if ( D ) {
                        //mark the character is already used
                        inChar[i] = '#';
                        rtnValue=rtnValue + this.numberCorrect;
                        break;
                    }
                }
        }
        return rtnValue;
    }
}

public class Answers {
    private String answer;
    private String result;
    public Answers (String ans) {
        this.answer = new String (ans);
        result= new String ();
    }

    public String getResult () {return this.result;}
}

```

```

    public String getAnswer(){return this.answer;}
    public void setAnswer(String answer){this.answer = answer;}
    public void setResult(String result){this.result = result;}
}

```

[Program 2]

```

import java.io.*;
public class MasterMindGame {
    public static void main(String[] args) throws IOException {
        MasterMind mGame = new MasterMind();
        displayScreen();
        while (mGame.isProgress()){
            System.out.print("Enter Your Guess : ");
            

E

 ;
            System.out.print(mGame.getResult()+"\n");
        }
        if (mGame.isWon())
            System.out.print("YOU WIN");
        else {
            System.out.print("YOU LOST \n");
            System.out.print("CORRECT ANSWER IS " +
                             Game.getHiddenNumber());
        }
    }
    public static void displayScreen(){
        System.out.println("Please Guess four Hidden Digits");
    }
    private static String acceptNumber() throws IOException {
        BufferedReader br =
            new BufferedReader(new InputStreamReader(System.in));
        return br.readLine();
    }
}

```