

AST 10106 Group Project Report

Group:

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Introduction:

This program is mainly about play games , this is a simple game , it call Bull and Cows or guess number.

The Rule of the game is System will generate 4 digit number between 0 to 9 and store in array , it will not repeat same number , user have to try to guess the number one by one . After user input the 4 digit number one by one , the system will read the

number and the check the digit to find correct or not .Then it will print XAXB , the number in front of A mean the correct number , the number in front of B mean the total of correct number but incorrect place.

There is an example the correct answer is 5234, and the guesser guesses 5346, which is 1A2B. Among them, the position of 5 is correct, which is recorded as 1A, and the two numbers of 3 and 4 are correct, and the position is incorrect, so it is recorded as 2B together it is 1A2B. When it is 4A0B, it means user guess the correct number. At the same time, we have 10 times chance for user to guess number, if over, the user will lose.

```

1  package game;
2
3  import java.util.Scanner;
4  import java.util.Random;
5  import java.text.SimpleDateFormat;
6  import java.util.Date;
7
8  public class Game2 {
9
10     public static int guess = 10; // chance
11
12     private static void Game() { [...4 lines] }
13
14     private static void Date() { [...1 lines] }
15
16     private static void GameRule() { [...7 lines] }
17
18     private static void Menu() { [...3 lines] }
19
20     private static void PrintExit() { [...4 lines] }
21
22     private static void ReadMenu() { [...32 lines] }
23
24     private static void Function() { [...32 lines] }
25
26     private static void Function2() { [...8 lines] }
27
28     private static void Factorial() { [...34 lines] }
29
30
31     public static void main(String[] args) { [...1 lines] }
32 }
33
34 class Run {
35
36     int[] ran = new int[4];
37
38     public void Createnum() { [...14 lines] }
39 }
40
41 class Check {
42
43     int aFlag = 0;
44     int bFlag = 0;
45     int[] a1 = new int[4];
46     int[] b1 = new int[4];
47     int xa = 0;
48
49     public void Checknum() { [...18 lines] }
50
51     //stop user when the number repeat
52     public boolean CheckRepeat(int[] b1) { [...11 lines] }
53 }

```

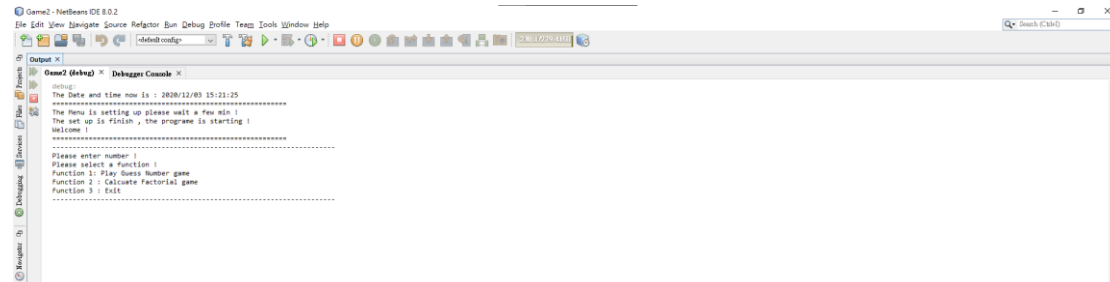
Menu

The start up will show the date and time when the user are start the program .After the date showed , it will load the other void .

```
171
172 public static void main(String[] args) {
173     Scanner sc = new Scanner(System.in);
174     Date();
175     Menu();
176     RealMenu();
177 }
178 }
179 }
180 }
```

```
59
60 private static void Date(){
61     Date date = new Date();
62     String DATE_FORMAT = "yyyy/MM/dd HH:mm:ss";
63     SimpleDateFormat sdf = new SimpleDateFormat("yyyy/MM/dd HH:mm:ss");
64     String time = sdf.format(date);
65     System.out.println("The Date and time now is : " + time );
66 }
67 }
```

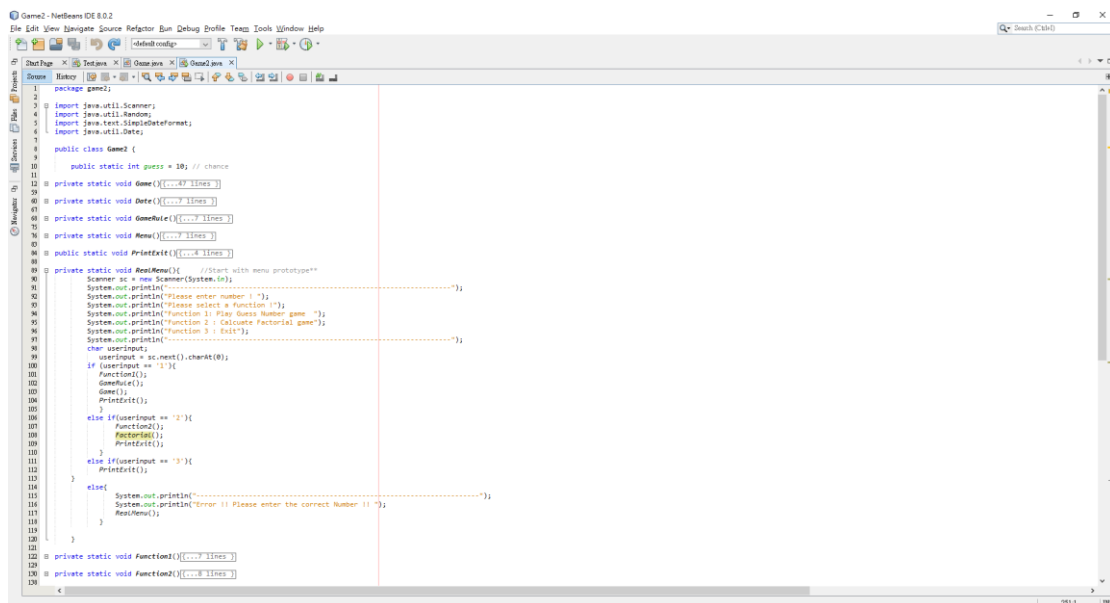
```
76 private static void Menu(){
77     System.out.println("=====");
78     System.out.println("The Menu is setting up please wait a few min ! ");
79     System.out.println("The set up is finish , the programe is starting ! ");
80     System.out.println("Welcome !");
81     System.out.println("=====");
82 }
```



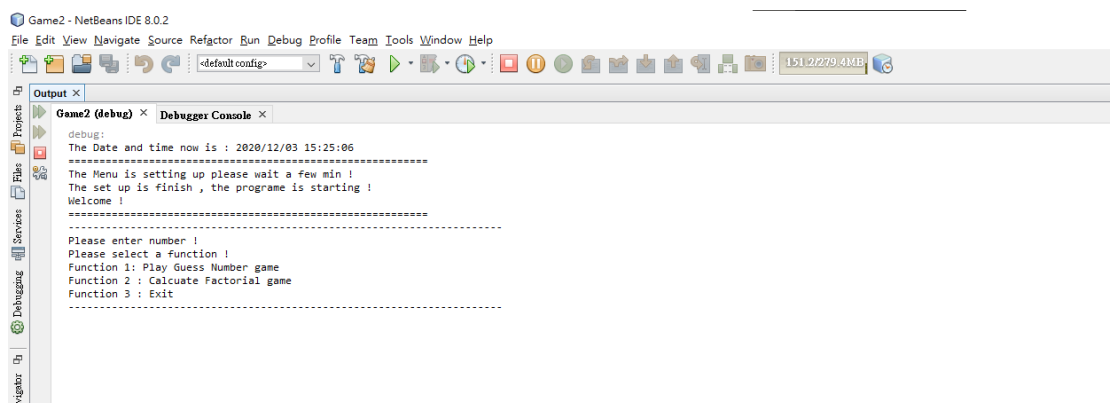
The screenshot shows the NetBeans IDE interface. The top part displays three code snippets for the `main`, `Date`, and `Menu` methods. The bottom part shows the IDE's output and debugger console. The output window displays the following text:

```
Output:
The Date and time now is : 2020/12/09 15:21:25
=====
The Menu is setting up please wait a few min !
The set up is finish , the programe is starting !
Welcome !
=====
Please enter number :
Please select a function :
Function 1 : Play Guess Number game
Function 2 : Calculate Factorial game
Function 3 : Exit
```

After finish the welcome , we will create a menu to ask user to type the number to get into play game , the first number is play guess number game , the second one is Calculate Factorial game , the last is exit program at the same time , the reason we create two menu is let the menu can keep loop after finish game .

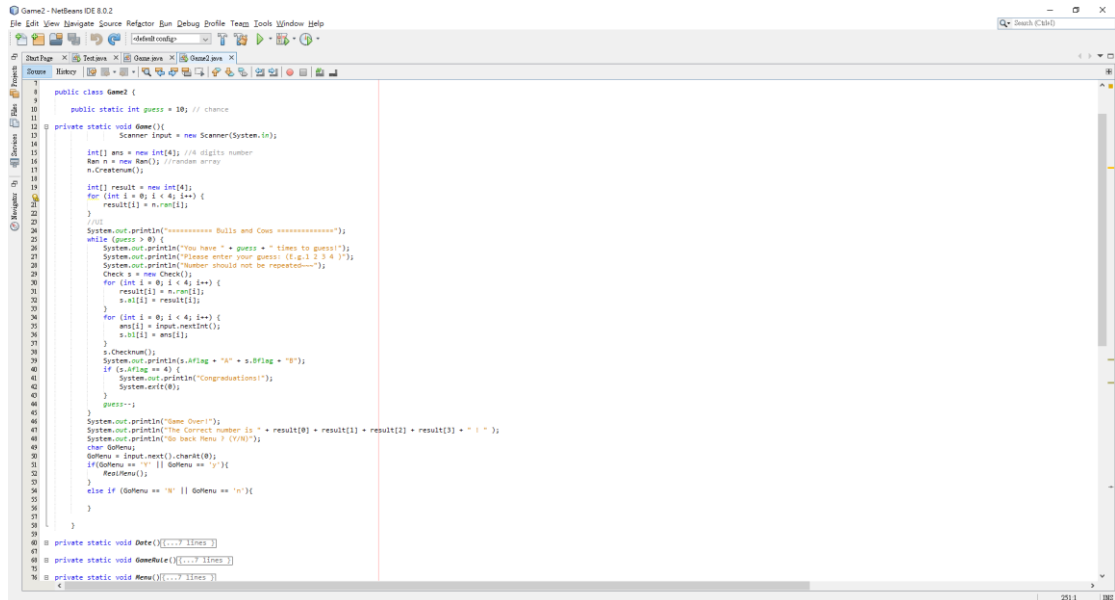


```
1 package game2;
2
3 import java.util.Scanner;
4 import java.util.Random;
5 import java.text.SimpleDateFormat;
6 import java.util.Date;
7
8 public class Game2 {
9     public static int guess = 10; // chance
10
11     private static void Game1() { ... }
12     private static void Deter() { ... }
13     private static void GameDeter() { ... }
14     private static void Menu() { ... }
15     private static void PrintExit() { ... }
16
17     private static void RealMenu() { //Start with menu prototype**
18         Scanner sc = new Scanner(System.in);
19         System.out.println("Please enter number 1");
20         System.out.println("Please select a function");
21         System.out.println("Function 1: Play Guess Number game");
22         System.out.println("Function 2: Calculate Factorial game");
23         System.out.println("Function 3: Exit");
24         System.out.println("-----");
25
26         char userInput;
27         userInput = sc.next().charAt(0);
28         if (userInput == '1') {
29             Function1();
30             GameDeter();
31             PrintExit();
32         }
33         else if (userInput == '2') {
34             Function2();
35             Factorial();
36             PrintExit();
37         }
38         else if (userInput == '3') {
39             PrintExit();
40         }
41         else {
42             System.out.println("Error !! Please enter the correct Number !!");
43             RealMenu();
44         }
45     }
46
47     private static void Function1() { ... }
48     private static void Function2() { ... }
49 }
```

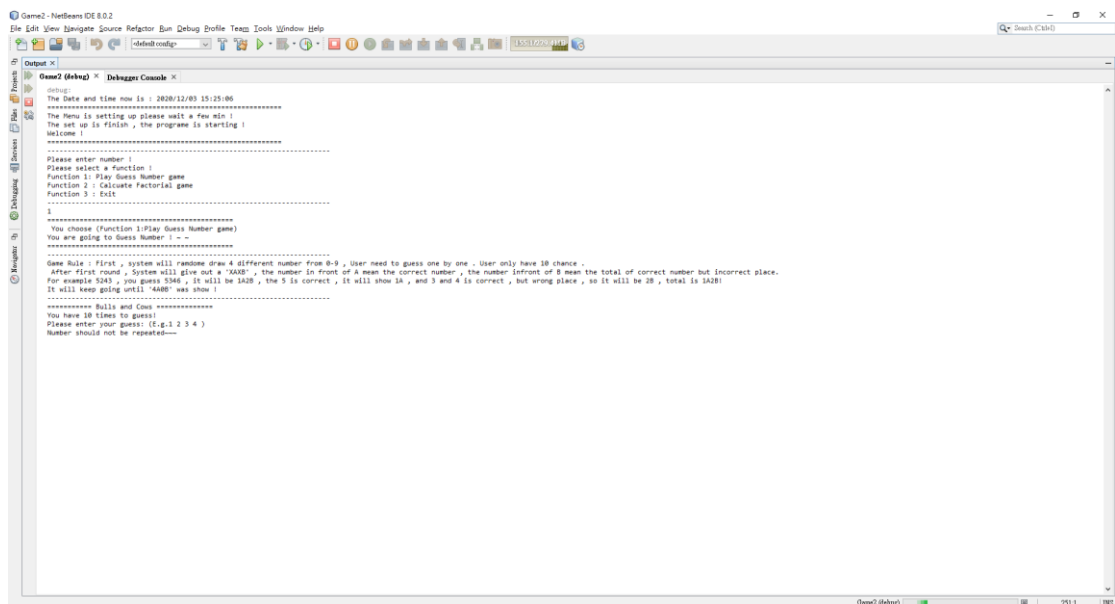


```
Game2 (debug) x Debugger Console x
debug:
The Date and time now is : 2020/12/03 15:25:06
=====
The Menu is setting up please wait a few min !
The set up is finish , the program is starting !
Welcome !
=====
Please enter number !
Please select a function !
Function 1: Play Guess Number game
Function 2 : Calculate Factorial game
Function 3 : Exit
=====
```

If user input 1 it will show the user input , explain the rule and start to play guess number game.



```
1 public class Game2 {
2     public static int guess = 10; // chance
3
4     private static void Game(){
5         Scanner input = new Scanner(System.in);
6
7         int[] ans = new int[4]; // 4 digits number
8         int n = new Ran(); // random array
9         n.CreateNum();
10
11         int[] result = new int[4];
12         for (int i = 0; i < 4; i++) {
13             result[i] = n.ran[i];
14         }
15
16         //Game Rule
17         System.out.println("===== Bulls and Cows =====");
18         while (guess > 0) {
19             System.out.println("You have " + guess + " times to guess!");
20             System.out.println("Please enter your guess (1,2,3,4)");
21             System.out.println("Number should not be repeated---");
22             Check s = new Check();
23             for (int i = 0; i < 4; i++) {
24                 result[i] = n.ran[i];
25                 s.all[i] = result[i];
26             }
27             for (int i = 0; i < 4; i++) {
28                 while (input.hasNextInt()) {
29                     s.all[i] = input.nextInt();
30                     s.all[i] = ans[i];
31                 }
32                 s.CheckNum();
33                 System.out.println(s.sFlag + "A" + s.sFlag + "B");
34                 if (s.sFlag == 4) {
35                     System.out.println("Congratulations!");
36                     System.exit(0);
37                 }
38             }
39             guess--;
40             System.out.println("Game Over!");
41             System.out.println("The correct number is " + result[0] + result[1] + result[2] + result[3] + " ! ");
42             System.out.println("Do back Menu ? (Y/N)");
43             char GoMenu;
44             GoMenu = input.next().charAt(0);
45             if (GoMenu == 'Y' || GoMenu == 'y') {
46                 RealMenu();
47             }
48             else if (GoMenu == 'N' || GoMenu == 'n') {
49                 //
50             }
51         }
52     }
53
54     private static void Data() { ... }
55     private static void GameRule() { ... }
56     private static void Menu() { ... }
57 }
```



```
1 The Date and time now is : 2020/12/03 15:25:06
2 =====
3 The Menu is setting up please wait a few min !
4 The set up is finish , the program is starting !
5 Welcome !
6 =====
7 Please enter number !
8 Please select a function !
9 Function 1 : Play Guess Number game
10 Function 2 : Calculate Factorial game
11 Function 3 : Exit
12 =====
13 You choose (Function 1)Play Guess Number game)
14 You are going to Guess Number 1 - =
15 =====
16 Game Rule : First , system will random draw 4 different number from 0-9 , User need to guess one by one . User only have 10 chance .
17 After first round , System will give out a "A0B" , the number in front of A mean the correct number , the number in front of B mean the total of correct number but incorrect place.
18 For example 5345 , you guess 5346 , it will be 1A2B , the 5 is correct , it will show 1A , and 3 and 4 is correct , so it will be 2B , total is 1A2B
19 It will keep going until "4000" was show !
20 ===== Bulls and Cows =====
21 You have 10 times to guess!
22 Please enter your guess: (1,2,3,4)
23 Number should not be repeated---
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12
```

```

121 //private static void Function1() { ... 7 lines ... }
122 //private static void Function2() { ... 8 lines ... }
123 //private static void Function3() { ... 3 lines ... }
124 //private static void Function4() { ... 3 lines ... }
125
126 public static void main(String[] args) { ... 1 lines ... }
127
128 class Run {
129     int[] ran = new int[4];
130
131     public void Createnum() {
132         Random r = new Random();
133         int flag = 0;
134         for (int i = 0; i < 4; i++) {
135             int rand = r.nextInt(10);
136             if (i == 0) {
137                 ran[i] = rand;
138             }
139             while (i != 0) {
140                 for (int j = i - 1; j >= 0; j--) {
141                     if (ran[j] == ran[i]) {
142                         flag = 1;
143                     }
144                 }
145                 if (flag == 1) {
146                     rand = r.nextInt(10);
147                     flag = 0;
148                 } else {
149                     ran[i] = rand;
150                     break;
151                 }
152             }
153         }
154     }
155 }
156
157 class Check {
158     int aflag = 0;
159     int bflag = 0;
160     int[] a1 = new int[4];
161     int[] b1 = new int[4];
162     int an = 0;
163
164     public void Checknum() { ... 18 lines ... }
165
166     //stop user when the number repeat
167     public boolean CheckRepeat(int[] b1) { ... 18 lines ... }
168 }

```

Then put the user input into “ans[]” , after that go into class “check” , check if user input the same digits or not .

```

238 //stop user when the number repeat
239 public boolean CheckRepeat(int[] b1) {
240     boolean check = false;
241     for (int i = 0; i < b1.length; i++) {
242         for (int j = 0; j < b1.length; j++) {
243             if ((b1[j] == b1[i]) && (i != j)) {
244                 check = true;
245             }
246         }
247     }
248     return check;
249 }
250
251 }

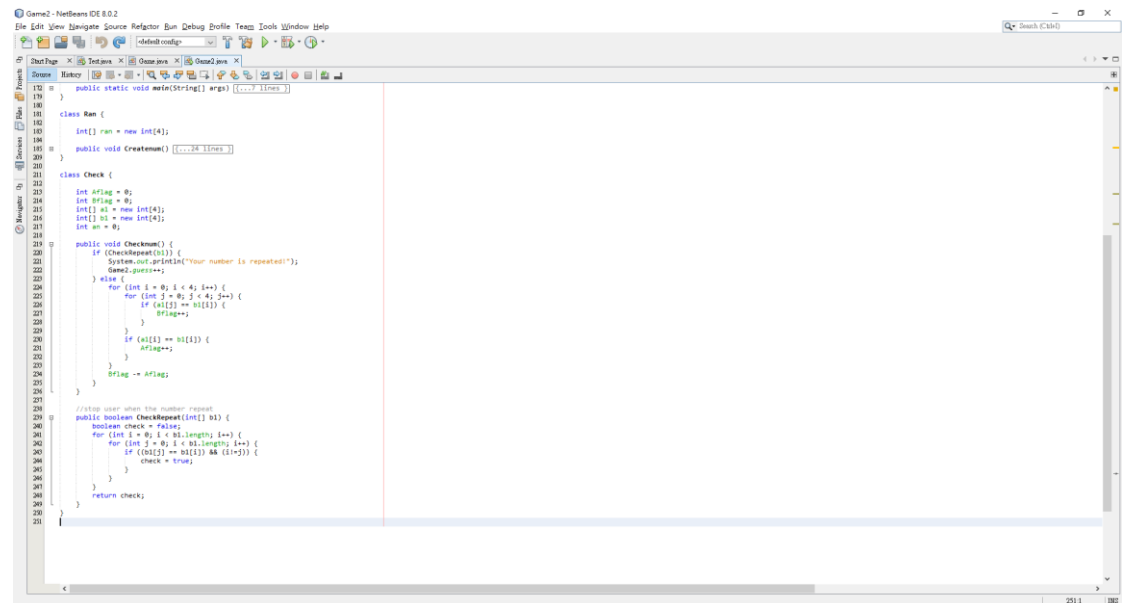
```

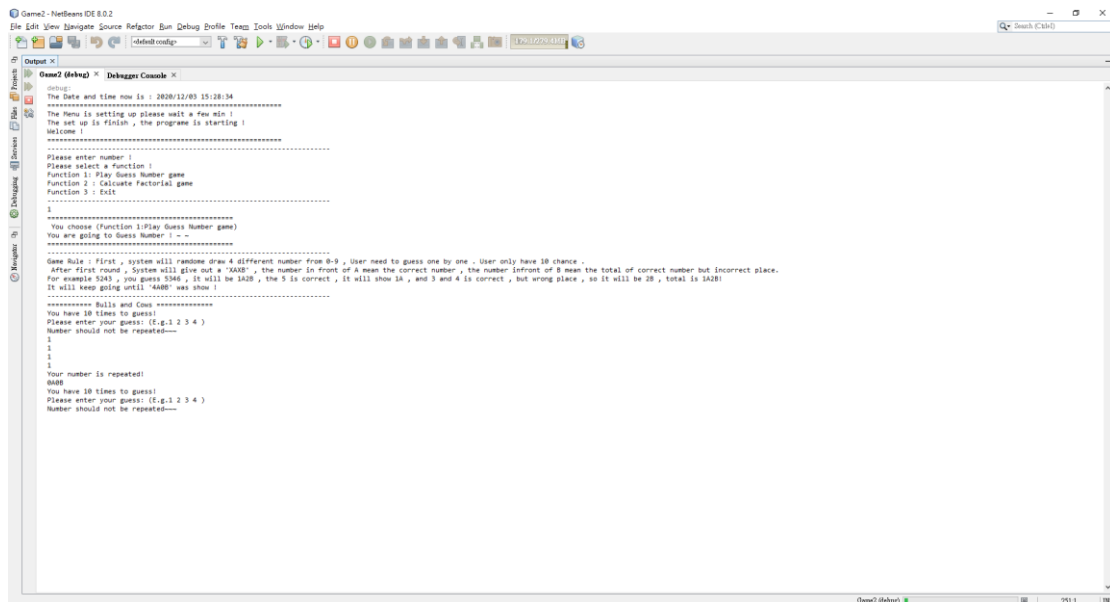
If input repeat ,it will print user entered the repeat number , then give a chance for user to do again . If user do not enter repeat number , then it will check the user input is match the system created number , then go back to show as “XAXB” and decrease the chance .

```

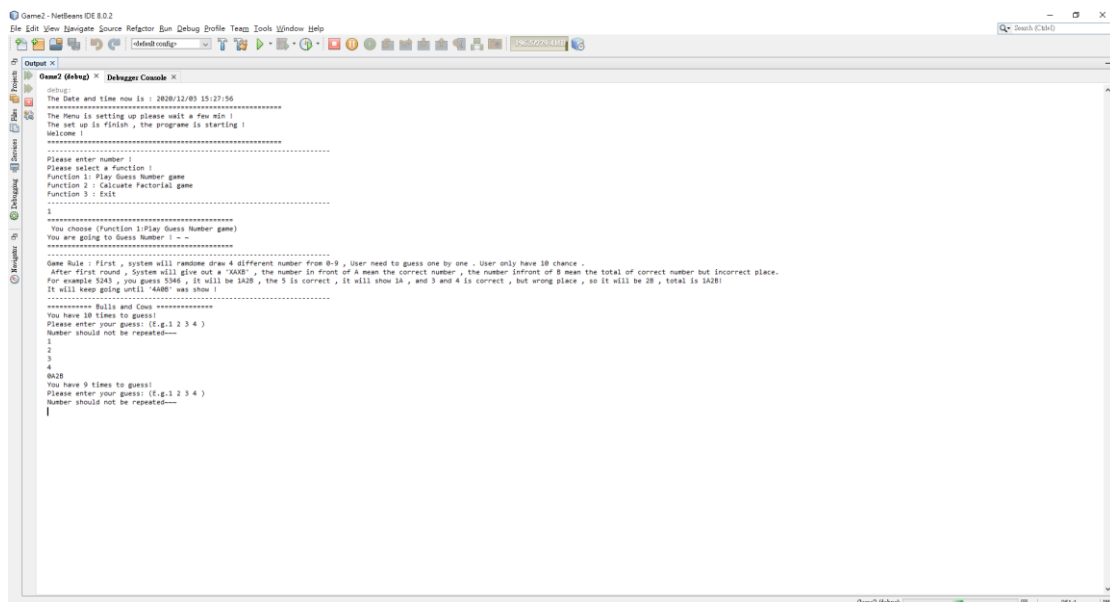
3 //UI
4 System.out.println("===== Bulls and Cows =====");
5 while (guess > 0) {
6     System.out.println("You have " + guess + " times to guess!");
7     System.out.println("Please enter your guess: (E.g.1 2 3 4)");
8     System.out.println("Number should not be repeated~~~");
9     Check s = new Check();
10    for (int i = 0; i < 4; i++) {
11        result[i] = n.ran[i];
12        s.a1[i] = result[i];
13    }
14    for (int i = 0; i < 4; i++) {
15        ans[i] = input.nextInt();
16        s.b1[i] = ans[i];
17    }
18    s.Checknum();
19    System.out.println(s.Aflag + "A" + s.Bflag + "B");
20    if (s.Aflag == 4) {
21        System.out.println("Congraduations!");
22        System.exit(0);
23    }
24    guess--;
25 }

```





```
devcpp:
The Date and time now is : 2020/12/03 15:28:34
=====
The Menu is setting up please wait a few min !
The set up is finish , the program is starting !
Welcome !
=====
Please enter number !
Please select a function !
Function 1 : Play Guess Number game
Function 2 : Calculate Factorial game
Function 3 : Exit
=====
1
=====
You choose (Function 1:Play Guess Number game)
You are going to Guess Number : - -
=====
Game Rule : First , system will random draw 4 different number from 0-9 , User need to guess one by one . User only have 10 chance .
After first round , system will give out a "0488" , the number in front of 4 mean the correct number , the number in front of 8 mean the total of correct number but incorrect place.
For example 5345 , you guess 5346 , it will be 1028 , the 5 is correct , it will show 10 , and 3 and 4 is correct , but wrong place , so it will be 28 , total is 1028!
It will keep going until "4080" was show !
===== Bulls and Cows =====
You have 10 times to guess!
Please enter your guess: (f.g:1 2 3 4 )
Number should not be repeated----
1
1
1
Your number is repeated!
0488
You have 10 times to guess!
Please enter your guess: (f.g:1 2 3 4 )
Number should not be repeated----
```



```
devcpp:
The Date and time now is : 2020/12/03 15:27:56
=====
The Menu is setting up please wait a few min !
The set up is finish , the program is starting !
Welcome !
=====
Please enter number !
Please select a function !
Function 1 : Play Guess Number game
Function 2 : Calculate Factorial game
Function 3 : Exit
=====
1
=====
You choose (Function 1:Play Guess Number game)
You are going to Guess Number : - -
=====
Game Rule : First , system will random draw 4 different number from 0-9 , User need to guess one by one . User only have 10 chance .
After first round , system will give out a "0428" , the number in front of 4 mean the correct number , the number in front of 8 mean the total of correct number but incorrect place.
For example 5345 , you guess 5346 , it will be 1028 , the 5 is correct , it will show 10 , and 3 and 4 is correct , but wrong place , so it will be 28 , total is 1028!
It will keep going until "4080" was show !
===== Bulls and Cows =====
You have 10 times to guess!
Please enter your guess: (f.g:1 2 3 4 )
Number should not be repeated----
1
2
3
4
0428
You have 9 times to guess!
Please enter your guess: (f.g:1 2 3 4 )
Number should not be repeated----
```

After that the system will show the correct number and ask if user want to go back to menu. If user said Yes , then it will go back to menu , if user said no it will end program .


```
Game2 (Win32) - Debug Console
579578
785
8488
You have 4 times to guess!
Please enter your guess: (1,2,3,4)
Number should not be repeated---
57
87
7
Your number is repeated!
6488
You have 4 times to guess!
Please enter your guess: (1,2,3,4)
Number should not be repeated---
587
27
6
Your number is repeated!
7851
7827
24
52
8488
You have 3 times to guess!
Please enter your guess: (1,2,3,4)
Number should not be repeated---
877
2
4
5
1488
You have 2 times to guess!
Please enter your guess: (1,2,3,4)
Number should not be repeated---
68
546
3
54
8418
You have 1 times to guess!
Please enter your guess: (1,2,3,4)
Number should not be repeated---
78
1
4
7
8418
Game Over!
The Correct number is 8291 !
Go back Menu ? (Y/N)
```

```
4
7
0A1B
Game Over!
The Correct number is 8291 !
Go back Menu ? (Y/N)
N
BYE!
Thank you for using this programe !~
BUILD SUCCESSFUL (total time: 1 minute 51 seconds)
|
```

```
0
1
4
0A1B
Game Over!
The Correct number is 8320 !
Go back Menu ? (Y/N)
Y
-----
Please enter number !
Please select a function !
Function 1: Play Guess Number game
Function 2 : Calculate Factorial game
Function 3 : Exit
-----
|
```

The other game is let user guess the factorial , when user input the number(not larger than 16) , system will calculate it and ask if user that is correct or not . If user correct , the game win , if user not correct , the game loss.

Game2 - NetBeans IDE 8.0.2

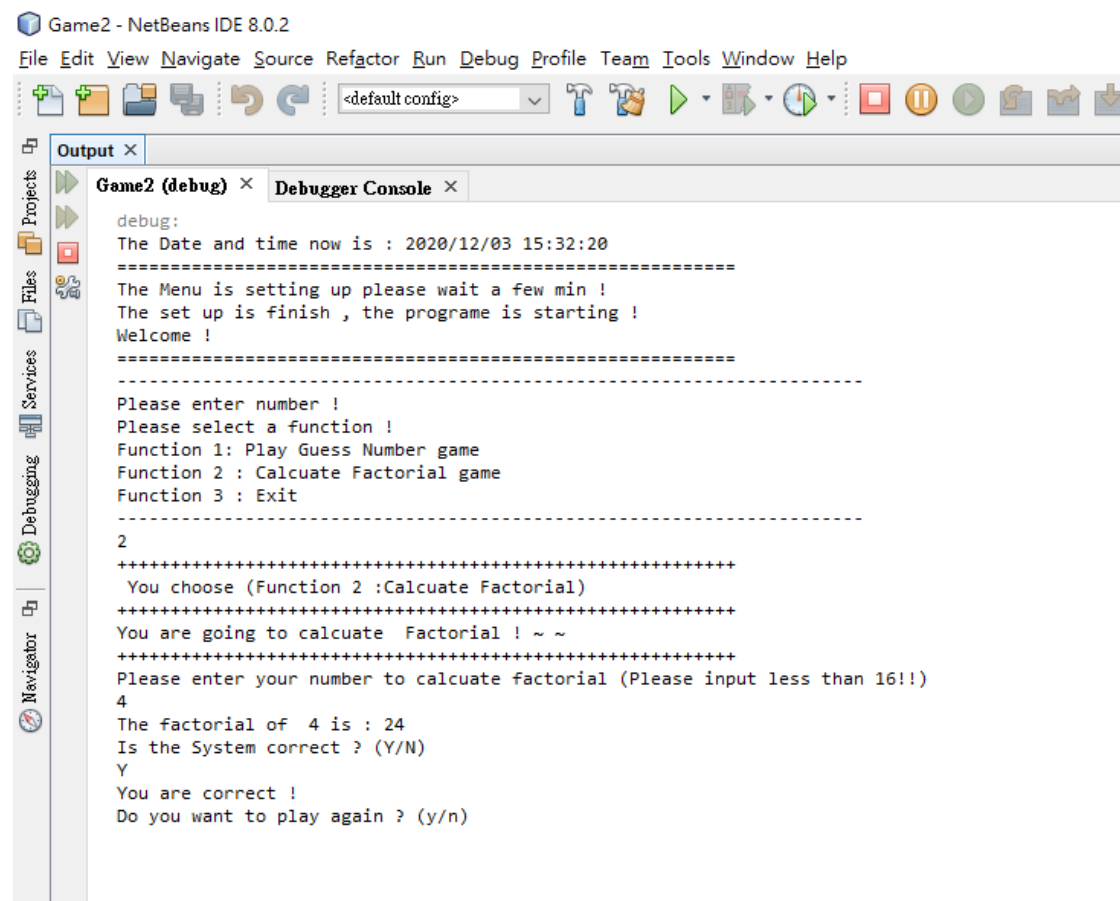
File Edit View Navigate Source Refactor Run Debug Profile Team Tools Window Help



Output ×

Game2 (debug) × Debugger Console ×

```
debug:
The Date and time now is : 2020/12/03 15:32:20
=====
The Menu is setting up please wait a few min !
The set up is finish , the programe is starting !
Welcome !
=====
-----
Please enter number !
Please select a function !
Function 1: Play Guess Number game
Function 2 : Calcuatate Factorial game
Function 3 : Exit
-----
2
+++++
You choose (Function 2 :Calcuatate Factorial)
+++++
You are going to calcuate Factorial ! ~ ~
+++++
Please enter your number to calcuate factorial (Please input less than 16!!)
4
The factorial of 4 is : 24
Is the System correct ? (Y/N)
|
```



The screenshot shows the NetBeans IDE 8.0.2 interface. The top menu bar includes File, Edit, View, Navigate, Source, Refactor, Run, Debug, Profile, Team, Tools, Window, and Help. The toolbar contains various icons for file operations, running, and debugging. The left sidebar shows the Projects, Files, Services, Debugging, and Navigator tabs. The main window displays the 'Game2 (debug)' window with the 'Debugger Console' tab active. The console output shows the program's execution, including a welcome message, a menu of functions, and a calculation of the factorial of 4.

```
debug:
The Date and time now is : 2020/12/03 15:32:20
=====
The Menu is setting up please wait a few min !
The set up is finish , the programe is starting !
Welcome !
=====
-----
Please enter number !
Please select a function !
Function 1: Play Guess Number game
Function 2 : Calcuate Factorial game
Function 3 : Exit
-----
2
+++++
You choose (Function 2 :Calcuate Factorial)
+++++
You are going to calcuate Factorial ! ~ ~
+++++
Please enter your number to calcuate factorial (Please input less than 16!!)
4
The factorial of 4 is : 24
Is the System correct ? (Y/N)
Y
You are correct !
Do you want to play again ? (y/n)
```

After that , the system will ask user want to play again or not , if user type “y” , it will keep play the game , if user say “n” , then the program will go back to menu to ask user select the menu option .

Game2 - NetBeans IDE 8.0.2

File Edit View Navigate Source Refactor Run Debug Profile Team Tools Window Help



Output x

Game2 (debug) x Debugger Console x

```
debug:
The Date and time now is : 2020/12/03 15:32:20
=====
The Menu is setting up please wait a few min !
The set up is finish , the programe is starting !
Welcome !
=====
-----
Please enter number !
Please select a function !
Function 1: Play Guess Number game
Function 2 : Calcuate Factorial game
Function 3 : Exit
-----
2
+++++
You choose (Function 2 :Calcuate Factorial)
+++++
You are going to calcuate Factorial ! ~ ~
+++++
Please enter your number to calcuate factorial (Please input less than 16!!)
4
The factorial of 4 is : 24
Is the System correct ? (Y/N)
Y
You are correct !
Do you want to play again ? (y/n)
y
Please enter your number to calcuate factorial (Please input less than 16!!)
```

```

+++++
You choose (Function 2 :Calcuete Factorial)
+++++
You are going to calculate Factorial ! ~ ~
+++++
Please enter your number to calculate factorial (Please input less than 16!!)
4
The factorial of 4 is : 24
Is the System correct ? (Y/N)
Y
You are correct !
Do you want to play again ? (y/n)
y
Please enter your number to calculate factorial (Please input less than 16!!)
4
The factorial of 4 is : 24
Is the System correct ? (Y/N)
Y
You are correct !
Do you want to play again ? (y/n)
n

-----
Please enter number !
Please select a function !
Function 1: Play Guess Number game
Function 2 : Calcuete Factorial game
Function 3 : Exit
-----

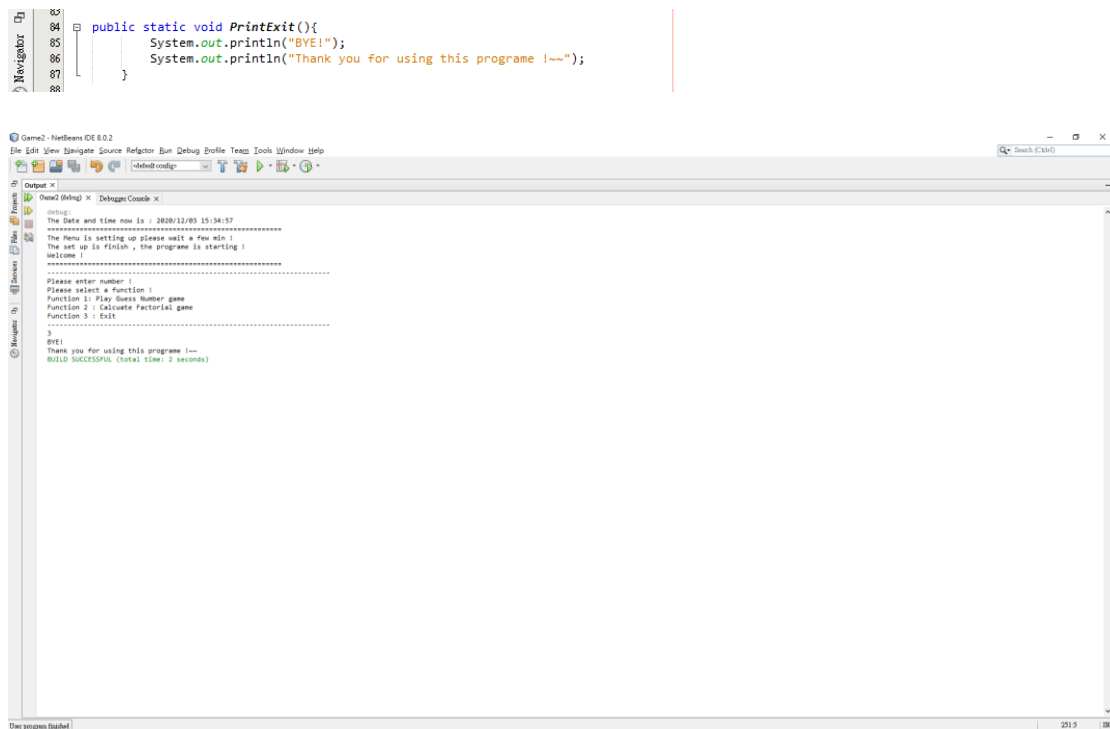
```

```

Game2 - NetBeans IDE 8.0.2
File Edit View Window Source Refactor Run Debug Profile Tools Window Help
default.config
Source Run
119 // private static void Menu() { ... 1 lines ... }
120 //
121 // public static void PrintText() { ... 4 lines ... }
122 //
123 // private static void ReadMenu() { ... 2 lines ... }
124 //
125 // private static void Function1() { ... 7 lines ... }
126 //
127 // private static void Function2() { ... 8 lines ... }
128 //
129 // private static void Factorial() {
130 //     int fac = 1;
131 //     Scanner sc = new Scanner(System.in);
132 //     System.out.println("Please enter your number to calculate factorial (Please input less than 16!!)");
133 //     int x = sc.nextInt();
134 //     for (int i = 1; i <= x; i++) {
135 //         fac = fac * i;
136 //     }
137 //     System.out.println("The factorial of " + x + " is : " + fac);
138 //     System.out.println("Is the System correct ? (Y/N)");
139 //     char correct;
140 //     correct = sc.next().charAt(0);
141 //     if (correct == 'Y' || correct == 'y') {
142 //         System.out.println("You are correct !");
143 //     }
144 //     else if (correct == 'N' || correct == 'n') {
145 //         System.out.println("You are wrong !");
146 //     }
147 //     System.out.println("Do you want to play again ? (y/n)");
148 //     char playagain;
149 //     playagain = sc.next().charAt(0);
150 //     if (playagain == 'Y' || playagain == 'y') {
151 //         Factorial();
152 //     }
153 //     else if (playagain == 'N' || playagain == 'n') {
154 //         ReadMenu();
155 //     }
156 // }
157 //
158 // public static void main(String[] args) { ... 7 lines ... }
159 //
160 // class Run {
161 //     int[] ran = new int[4];
162 // }
163 //
164 // public void Createnum() { ... 24 lines ... }
165 //
166 // class Check {
167 //     int Aring = 0;
168 //     int Arout = 0;
169 // }

```

Before the program finish , it will print the exit program .



Presentation Link:

Part1: <https://youtu.be/TJ1-Vf8coqU> (by CHAN WAI CHUNG)

Part2: <https://youtu.be/8IzIzEgrQIQ>(by LIZHIHAO)

Part3: https://youtu.be/o4P_njubVs4 (by LO TSZ KIN)