

Design and Development of Rock-Paper-Scissors Game using Java

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Submit to

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03603112 Programming Fundamentals

สารบัญ

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Source code in GitHub

- Team Repository name: F2-256802-T01

- Folder: AS01-Rock-Paper-Scissors

How to compile and run the program

Rock-Paper-Scissors Program

Rules of the rock-paper-scissors game

เกมเป่ายิ่งจุบ เป็นเกมที่ผู้เล่นเลือกหนึ่งในสามตัวเลือก “ได้แก่ ค้อน(Rock),กระดาษ(Paper),กรรไกร (Scissors) มีกฎการดังนี้

- ค้อน ชนะ กรรไกร
- กรรไกร ชนะ กระดาษ
- กระดาษ ชนะ ค้อน
- หากผู้เล่นและคอมพิวเตอร์เลือกเหมือนกัน จะถือว่าเสมอ

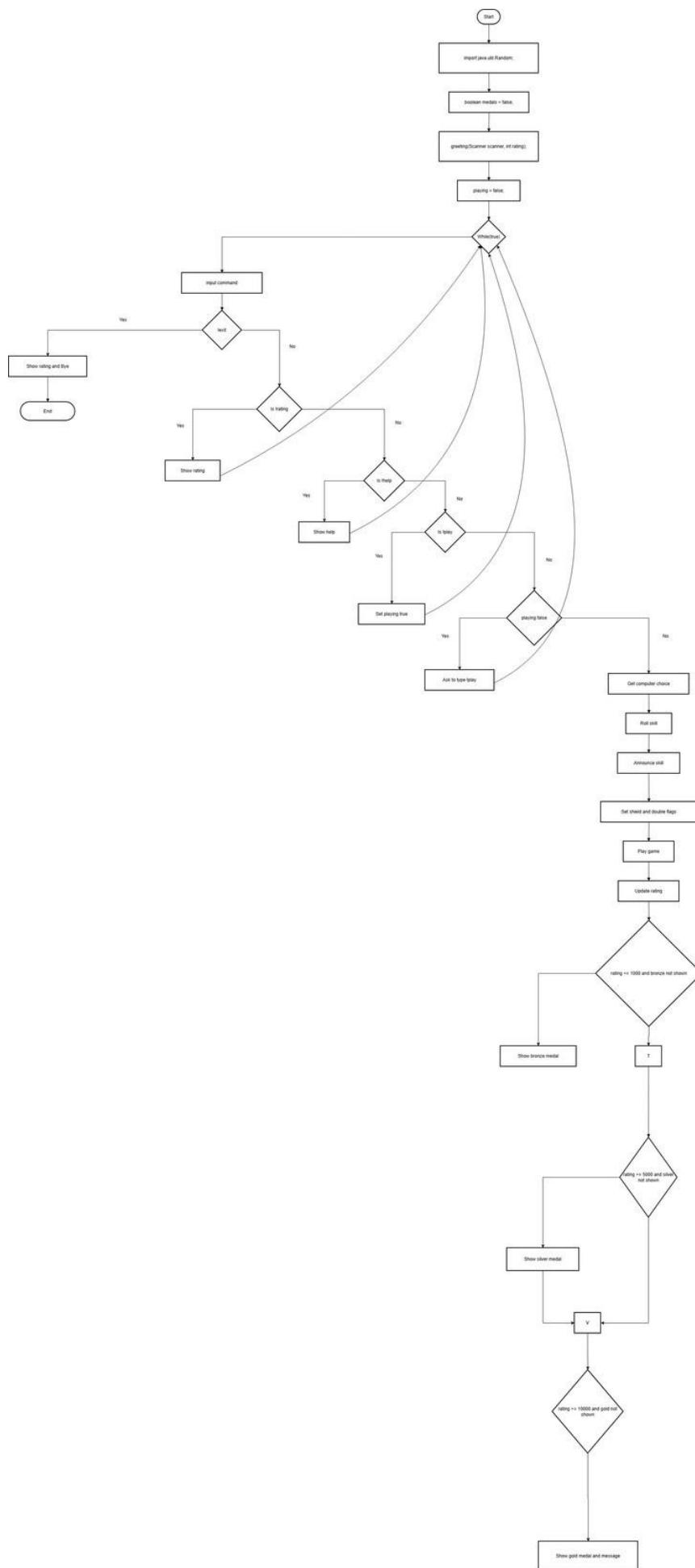
Sample runs

ตัวอย่างผลลัพธ์ที่ได้จากการรันโปรแกรมแสดงให้เห็นการเลือกของผู้เล่นและคอมพิวเตอร์ รวมถึงผลลัพธ์ของเกม

```
PS C:\Users\jetniphat\Documents\F2-256802-T10> javac .\Rock_Paper_Scissors.java
PS C:\Users\jetniphat\Documents\F2-256802-T10> java Rock_Paper_Scissors
Enter your name: Jeff
Hello, Jeff!
Current Score: 0
Let's play Rock-Paper-Scissors!
Commands:
!play = start playing
!rating = show your current score
!help = show commands
!exit = exit the game
> !play
Game started! Type: rock / paper / scissors
> rock
There is a draw (rock)
> rock
There is a draw (rock)
> rock
Well done. The computer chose scissors and failed
> rock
[Skill] Computer got: Attack x2 (Double)
Sorry, but the computer chose paper
> !help
Commands:
!play = start playing
!rating = show your current score
!help = show commands
!exit = exit the game
Moves: rock, paper, scissors
> !rating
Your rating: 200
> !exit
Your rating: 200
Bye!
```

Program Design

Flowchart



Program Design

Program Structure

```
F2-256802-110 > J Rock_Paper_Scissors.java > Rock_Paper_Scissors > greeting(Scanner, int)
1 import java.util.Random;
2 import java.util.Scanner;
3
4 public class Rock_Paper_Scissors {
5
6     public static String greeting(Scanner scanner, int rating) {
7         String player;
8
9         System.out.print("Enter your name: ");
10        player = scanner.nextLine();
11        System.out.println("Hello, " + player + "!");
12        System.out.println("Current Score: " + rating);
13        System.out.println("Let's play Rock-Paper-Scissors!");
14        System.out.println("Commands:");
15        System.out.println("play = start playing");
16        System.out.println("rating = show your current score");
17        System.out.println("help = show commands");
18        System.out.println("exit = exit the game");
19
20        return player;
21    }
22
23    public static int userWin(String computer) {
24        System.out.println("Well done. The computer chose " + computer + " and failed");
25        return 100;
26    }
27
28    public static int userLose(String computer) {
29        System.out.println("Sorry, but the computer chose " + computer);
30        return 0;
31    }
32
33    public static int userDraw(String computer) {
34        System.out.println("There is a draw (" + computer + ")");
35        return 50;
36    }
37}
```

```
37
38     public static int[] rollSkill(Random random) {
39         int skillOwner = 0;
40         int skillType = 0;
41
42         int chance = random.nextInt(bound: 100);
43         if (chance < 30) {
44             skillOwner = random.nextBoolean() ? 1 : 2;
45             skillType = random.nextBoolean() ? 1 : 2;
46         }
47
48         return new int[]{skillOwner, skillType};
49     }
50
51     public static void announceSkill(String playerName, int[] skill) {
52         int owner = skill[0];
53         int type = skill[1];
54
55         if (owner == 0)
56             return;
57
58         String who = (owner == 1) ? playerName : "Computer";
59         if (type == 1) {
60             System.out.println("[Skill] " + who + " got: AI attack has no effect (Shield)");
61         } else if (type == 2) {
62             System.out.println("[Skill] " + who + " got: Attack x2 (Double)");
63         }
64     }
65
66     public static int playGame(String playerChoice, String computer,
67                               boolean userShield, boolean aiShield, boolean userDouble) {
68
69         int rating = 0;
```

```
4 public class Rock_Paper_Scissors {
5     public static int playGame(String playerChoice, String computer,
6     ...
70
71         if (playerChoice.equals(computer)) {
72             return userDraw(computer);
73         }
74
75         boolean userWins = false;
76         boolean userLoses = false;
77
78         if (playerChoice.equals(anObject: "rock")) {
79             if (computer.equals(anObject: "scissors")) userWins = true;
80             else if (computer.equals(anObject: "paper")) userLoses = true;
81         } else if (playerChoice.equals(anObject: "paper")) {
82             if (computer.equals(anObject: "rock")) userWins = true;
83             else if (computer.equals(anObject: "scissors")) userLoses = true;
84         } else if (playerChoice.equals(anObject: "scissors")) {
85             if (computer.equals(anObject: "paper")) userWins = true;
86             else if (computer.equals(anObject: "rock")) userLoses = true;
87         } else {
88             System.out.println(x: "Invalid input!");
89             return 0;
90         }
91
92         if (userWins) {
93             rating = userWin(computer);
94             if (userDouble) {
95                 rating *= 2;
96                 System.out.println(x: "[Skill Effect] Your attack is x2! Bonus doubled.");
97             }
98         } else if (userLoses) {
99             if (userShield) {
100                 rating = userDraw(computer);
101                 System.out.println(x: "[Skill Effect] Shield activated! AI attack has no effect.");
102             } else if (aiShield) {
103                 rating = userDraw(computer);
```

```
4  public class Rock_Paper_Scissors {
66      public static int playGame(String playerchoice, String computer,
104         System.out.println(x: "[Skill Effect] Computer's Shield activated! Your attack has no effect.");
105     } else {
106         rating = userLose(computer);
107     }
108 }
109
110     return rating;
111 }
112
113     public static String getComputerChoice(Random random) {
114         String[] computerChoices = {"rock", "paper", "scissors"};
115         return computerChoices[random.nextInt(computerChoices.length)];
116     }
117
118     public static void printHelp() {
119         System.out.println(x: "Commands:");
120         System.out.println(x: "play   = start playing");
121         System.out.println(x: "rating = show your current score");
122         System.out.println(x: "help   = show commands");
123         System.out.println(x: "exit   = exit the game");
124         System.out.println(x: "Moves: rock, paper, scissors");
125     }
126
127 Run|Debug
128
129     public static void main(String[] args) {
130
131         int rating = 0;
132         Scanner scanner = new Scanner(System.in);
133         Random random = new Random();
134
135         boolean bronzeshown = false;
136         boolean silvershow = false;
137         boolean goldshow = false;
138 }
```

```
4  public class Rock_Paper_Scissors {
127     public static void main(String[] args) {
137
138         String playerName = greeting(scanner, rating);
139         boolean playing = false;
140
141         while (true) {
142             System.out.print(s: "> ");
143             String choice = scanner.nextLine().toLowerCase();
144
145             if (choice.equals(anObject: "!exit")) {
146                 System.out.println("Your rating: " + rating);
147                 System.out.println(x: "Bye!");
148                 break;
149             }
150
151             if (choice.equals(anObject: "!rating")) {
152                 System.out.println("Your rating: " + rating);
153                 continue;
154             }
155
156             if (choice.equals(anObject: "!help")) {
157                 printHelp();
158                 continue;
159             }
160
161             if (choice.equals(anObject: "!play")) {
162                 playing = true;
163                 System.out.println(x: "Game started! Type: rock / paper / scissors");
164                 continue;
165             }
166
167             if (!playing) {
168                 System.out.println(x: "Type !play to start playing (or !help for commands).");
169                 continue;
170             }
171 }
```

```
4  public class Rock_Paper_Scissors {
127    public static void main(String[] args) {
170        String computer = getComputerChoice(random);
171
172        int[] skill = rollSkill(random);
173        announceSkill(playerName, skill);
174
175        boolean userShield = (skill[0] == 1 && skill[1] == 1);
176        boolean aiShield = (skill[0] == 2 && skill[1] == 1);
177        boolean userDouble = (skill[0] == 1 && skill[1] == 2);
178
179        rating += playGame(choice, computer, userShield, aiShield, userDouble);
180
181        if (rating >= 1000 && !bronzeShown) {
182            System.out.println(x: "+-----+");
183            System.out.println(x: "| BRONZE MEDAL! |");
184            System.out.println(x: "| You reached 1000 points |");
185            System.out.println(x: "+-----+");
186            bronzeShown = true;
187        }
188
189        if (rating >= 5000 && !silverShown) {
190            System.out.println(x: "+-----+");
191            System.out.println(x: "| SILVER MEDAL! |");
192            System.out.println(x: "| You reached 5000 points |");
193            System.out.println(x: "+-----+");
194            silverShown = true;
195        }
196    }
197
198 }
```

```
4  public class Rock_Paper_Scissors {
127    public static void main(String[] args) {
178        boolean userDouble = (skill[0] == 1 && skill[1] == 2);
179
180        rating += playGame(choice, computer, userShield, aiShield, userDouble);
181
182        if (rating >= 1000 && !bronzeShown) {
183            System.out.println(x: "+-----+");
184            System.out.println(x: "| BRONZE MEDAL! |");
185            System.out.println(x: "| You reached 1000 points |");
186            System.out.println(x: "+-----+");
187            bronzeShown = true;
188        }
189
190        if (rating >= 5000 && !silverShown) {
191            System.out.println(x: "+-----+");
192            System.out.println(x: "| SILVER MEDAL! |");
193            System.out.println(x: "| You reached 5000 points |");
194            System.out.println(x: "+-----+");
195            silverShown = true;
196        }
197
198        if (rating >= 10000 && !goldShown) {
199            System.out.println(x: "+-----+");
200            System.out.println(x: "| GOLD MEDAL! |");
201            System.out.println(x: "| You reached 10000 points |");
202            System.out.println(x: "+-----+");
203            System.out.println(x: "| Ai: You're really boring, you know. |");
204            System.out.println(x: "| But it's not like I'm playing with you because |");
205            System.out.println(x: "| I like you or anything! |");
206            System.out.println(x: "+-----+");
207            goldShown = true;
208        }
209    }
210
211 }
```

Implementation

Source code in GitHub

ชอร์สโค้ดของโปรแกรมถูกจัดเก็บไว้บน GitHub เพื่อความสะดวกในการจัดการและตรวจสอบ

- ชื่อ Repository ของกลุ่ม: F2-256802-T01
- ไฟล์เดอร์: AS01-Rock-Paper-Scissors

How to compile and run the program

- เปิด Command Prompt หรือ Terminal
- ไปยังโฟลเดอร์ที่เก็บไฟล์ Rock_Paper_Scissors.java
- ใช้คำสั่ง javac Rock_Paper_Scissors.java เพื่ocompile โปรแกรม
- ใช้คำสั่ง java Rock_Paper_Scissors เพื่อรันโปรแกรม