Chapter 4 Projects - Part 6

Modified Pig Game

Game Setup

1. Both the player and computer start the game with a score of 0.
2. The player goes first. 2 dice (with 10 sides each) are rolled. There are 3 scenarios possible:
    a. Sum of 13: If the dice roll's sum is 13 (unlucky!), the game score for the current player is reset. Turn is forfeited.
    b. Doubles: If the both dice roll the same value, the round score is reset. Turn is forfeited.
    c. Any other roll: the roll sum is added to the round score. The player can choose to HOLD (the round score will be added to the game score, turn passed to other player) or ROLL (roll again, to maybe accumulate more points or risk losing it).
3. This alternates between player and computer. The computer will automatically keep rolling as long as the round score is below 40. Once it's above 40, it will hold.
4. First player to reach score of 100 wins!

Code

PigGame Class

```
package ch4.diceProjects;

import java.util.Scanner;

public class PigGame_Mod {

   static int pt, ct, pr, cr;
   static Scanner scn = new Scanner(System.in);
   static PairOfDice dice = new PairOfDice(10,10);

   public static void main(String[] args) {

      while(pt<100 && ct<100){
         player();
         if(!(pt<100 && ct<100)) break;
```

```
        computer();
    }

    System.out.println();

    if(pt>ct){
        System.out.println("PLAYER WINS!");
    }else{
        System.out.println("COMPUTER WINS!");
    }

    displayTotals();

}

public static void player(){

    System.out.println("\n---------- PLAYER");

    int playerchoice;
    pr = 0;

    while(true){

        displayTotals();
        displayChoices();
        System.out.print("Enter choice: ");
        playerchoice = scn.nextInt();
        System.out.println();

        if(playerchoice==1){
            rollDice();
            displayRoll();

            if(isDoubles()){
                System.out.println("Doubles! Round score reset, turn forfeited.");
                pr=0;
                break;
            }else if(is13()){
                System.out.println("Unlucky number 13! Total score reset, turn forfeited.");
                pt=0;
                pr=0;
                break;
            }else{
                System.out.println("Roll total: "+sumRoll());
                pr+=sumRoll();
            }
```

```
        }else{
            System.out.println("Holding...");
            pt+=pr;
            break;
        }

    }

}

public static void computer(){
    System.out.println("\n---------- COMPUTER");
    cr = 0;
    displayTotals();

    while(cr<40){

        rollDice();
        displayRoll();

        if(is13()){
            System.out.println("Unlucky number 13! Total score reset, turn forfeited.");
            cr=0;
            ct=0;
            break;
        }else if(isDoubles()){
            System.out.println("Doubles! Round score reset, turn forfeited.");
            cr=0;
            break;
        }else{
            cr+=sumRoll();
        }

        //displayTotals();

    }

    ct+=cr;
    displayTotals();


}

public static void rollDice(){
                dice.rollDice();
        }

        public static int sumRoll(){
```

```
            return dice.sumRoll();
        }

        public static boolean is13(){
            return dice.sumRoll()==13;
        }

        public static boolean isDoubles(){
            return dice.getDie1().getFaceVal()==dice.getDie2().getFaceVal();
        }

        public static void displayRoll(){
            System.out.println(dice.getDie1().getFaceVal()
                    +" , "+dice.getDie2().getFaceVal());
        }

    public static void displayTotals(){
        System.out.println("TOTALS = " + "Player: " + pt + "\t"+"Computer: " + ct);
    }

    public static void displayChoices(){
        System.out.println("0: HOLD / 1: ROLL");
    }

}
```

Die Class

```
package ch4.diceProjects;

public class Die {

    // DATA MEMBERS

    private int numSides;
    private int faceVal;


    // CONSTRUCTORS

    public Die(){
        numSides = 6;
        roll();
    }

    public Die(int sides) {
```

```
        numSides = sides;
        roll();
    }


    // METHODS

    public void roll(){
        faceVal = (int)(Math.random()*numSides+1);
    }

    public int getNumSides(){
        return numSides;
    }

    public int getFaceVal(){
        return faceVal;
    }

    public String toString(){
        return
        "- - - - DIE - - - -" + "\n" +
        "# of sides: " + numSides + "\n" +
        "Current face value: " + faceVal;
    }

}
```

PairOfDice Class

```
package ch4.diceProjects;

public class PairOfDice {

    //DATA MEMBERS

    private Die d1;
    private Die d2;


    //CONSTRUCTORS

    public PairOfDice(){
        d1 = new Die();
        d2 = new Die();
    }
```

```
   public PairOfDice(int s1, int s2){
      d1 = new Die(s1);
      d2 = new Die(s2);
   }


   //METHODS

   public Die getDie1(){
      return d1;
   }

   public Die getDie2(){
      return d2;
   }

   public boolean isHse(){
      return (d1.getFaceVal()==1 ^ d2.getFaceVal()==1);
   }

   public boolean isSe(){
      return (d1.getFaceVal()==1 && d2.getFaceVal()==1);
   }

   public void rollDice(){
      d1.roll();
      d2.roll();
   }

   public int sumRoll(){
      return d1.getFaceVal()+d2.getFaceVal();
   }

   public String toString(){
      return d1.toString() + "\n" + d2.toString();
   }

}
```

Sample Run

```
---------- PLAYER
TOTALS = Player: 0Computer: 0
0: HOLD / 1: ROLL
Enter choice: 1

1 , 4
Roll total: 5
TOTALS = Player: 0Computer: 0
0: HOLD / 1: ROLL
Enter choice: 1

6 , 8
Roll total: 14
TOTALS = Player: 0Computer: 0
0: HOLD / 1: ROLL
Enter choice: 1

7 , 1
Roll total: 8
TOTALS = Player: 0Computer: 0
0: HOLD / 1: ROLL
Enter choice: 1

6 , 8
Roll total: 14
TOTALS = Player: 0Computer: 0
0: HOLD / 1: ROLL
Enter choice: 1

2 , 10
Roll total: 12
TOTALS = Player: 0Computer: 0
0: HOLD / 1: ROLL
Enter choice: 0

Holding...

---------- COMPUTER
TOTALS = Player: 53          Computer: 0
6 , 9
6 , 7
Unlucky number 13! Total score reset, turn forfeited.
TOTALS = Player: 53          Computer: 0

---------- PLAYER
TOTALS = Player: 53          Computer: 0
0: HOLD / 1: ROLL
Enter choice: 1

5 , 8
```

```
Unlucky number 13! Total score reset, turn forfeited.

---------- COMPUTER
TOTALS = Player: 0Computer: 0
3 , 4
9 , 3
7 , 10
8 , 9
TOTALS = Player: 0Computer: 53

---------- PLAYER
TOTALS = Player: 0Computer: 53
0: HOLD / 1: ROLL
Enter choice: 1

1 , 4
Roll total: 5
TOTALS = Player: 0Computer: 53
0: HOLD / 1: ROLL
Enter choice: 1

1 , 8
Roll total: 9
TOTALS = Player: 0Computer: 53
0: HOLD / 1: ROLL
Enter choice: 1

1 , 8
Roll total: 9
TOTALS = Player: 0Computer: 53
0: HOLD / 1: ROLL
Enter choice: 0

Holding...

---------- COMPUTER
TOTALS = Player: 23            Computer: 53
4 , 5
9 , 7
3 , 3
Doubles! Round score reset, turn forfeited.
TOTALS = Player: 23            Computer: 53

---------- PLAYER
TOTALS = Player: 23            Computer: 53
0: HOLD / 1: ROLL
Enter choice: 1

3 , 2
Roll total: 5
TOTALS = Player: 23            Computer: 53
0: HOLD / 1: ROLL
Enter choice: 1
```

```
7 , 6
Unlucky number 13! Total score reset, turn forfeited.

---------- COMPUTER
TOTALS = Player: 0Computer: 53
1 , 7
2 , 8
9 , 5
3 , 9
TOTALS = Player: 0Computer: 97

---------- PLAYER
TOTALS = Player: 0Computer: 97
0: HOLD / 1: ROLL
Enter choice: 1

8 , 2
Roll total: 10
TOTALS = Player: 0Computer: 97
0: HOLD / 1: ROLL
Enter choice: 1

2 , 8
Roll total: 10
TOTALS = Player: 0Computer: 97
0: HOLD / 1: ROLL
Enter choice: 0

Holding...

---------- COMPUTER
TOTALS = Player: 20              Computer: 97
8 , 7
10 , 8
7 , 7
Doubles! Round score reset, turn forfeited.
TOTALS = Player: 20              Computer: 97

---------- PLAYER
TOTALS = Player: 20              Computer: 97
0: HOLD / 1: ROLL
Enter choice: 1

1 , 3
Roll total: 4
TOTALS = Player: 20              Computer: 97
0: HOLD / 1: ROLL
Enter choice: 1

10 , 7
Roll total: 17
TOTALS = Player: 20              Computer: 97
0: HOLD / 1: ROLL
Enter choice: 1
```

```
6 , 9
Roll total: 15
TOTALS = Player: 20             Computer: 97
0: HOLD / 1: ROLL
Enter choice: 0

Holding...

---------- COMPUTER
TOTALS = Player: 56             Computer: 97
8 , 2
1 , 3
7 , 6
Unlucky number 13! Total score reset, turn forfeited.
TOTALS = Player: 56             Computer: 0

---------- PLAYER
TOTALS = Player: 56             Computer: 0
0: HOLD / 1: ROLL
Enter choice: 1

10 , 5
Roll total: 15
TOTALS = Player: 56             Computer: 0
0: HOLD / 1: ROLL
Enter choice: 0

Holding...

---------- COMPUTER
TOTALS = Player: 71             Computer: 0
6 , 2
2 , 7
6 , 1
3 , 8
4 , 1
TOTALS = Player: 71             Computer: 40

---------- PLAYER
TOTALS = Player: 71             Computer: 40
0: HOLD / 1: ROLL
Enter choice: 1

10 , 3
Unlucky number 13! Total score reset, turn forfeited.

---------- COMPUTER
TOTALS = Player: 0Computer: 40
7 , 4
8 , 4
4 , 4
Doubles! Round score reset, turn forfeited.
TOTALS = Player: 0Computer: 40
```

---------- PLAYER
TOTALS = Player: 0Computer: 40
0: HOLD / 1: ROLL
Enter choice: 1

3 , 6
Roll total: 9
TOTALS = Player: 0Computer: 40
0: HOLD / 1: ROLL
Enter choice: 1

1 , 5
Roll total: 6
TOTALS = Player: 0Computer: 40
0: HOLD / 1: ROLL
Enter choice: 1

10 , 8
Roll total: 18
TOTALS = Player: 0Computer: 40
0: HOLD / 1: ROLL
Enter choice: 0

Holding...

---------- COMPUTER
TOTALS = Player: 33 Computer: 40
3 , 10
Unlucky number 13! Total score reset, turn forfeited.
TOTALS = Player: 33 Computer: 0

---------- PLAYER
TOTALS = Player: 33 Computer: 0
0: HOLD / 1: ROLL
Enter choice: 1

3 , 8
Roll total: 11
TOTALS = Player: 33 Computer: 0
0: HOLD / 1: ROLL
Enter choice: 1

1 , 1
Doubles! Round score reset, turn forfeited.

---------- COMPUTER
TOTALS = Player: 33 Computer: 0
5 , 2
3 , 10
Unlucky number 13! Total score reset, turn forfeited.
TOTALS = Player: 33 Computer: 0

---------- PLAYER

```
TOTALS = Player: 33          Computer: 0
0: HOLD / 1: ROLL
Enter choice: 1

1 , 8
Roll total: 9
TOTALS = Player: 33          Computer: 0
0: HOLD / 1: ROLL
Enter choice: 0

Holding...

---------- COMPUTER
TOTALS = Player: 42          Computer: 0
4 , 3
8 , 3
9 , 4
Unlucky number 13! Total score reset, turn forfeited.
TOTALS = Player: 42          Computer: 0

---------- PLAYER
TOTALS = Player: 42          Computer: 0
0: HOLD / 1: ROLL
Enter choice: 1

4 , 2
Roll total: 6
TOTALS = Player: 42          Computer: 0
0: HOLD / 1: ROLL
Enter choice: 0

Holding...

---------- COMPUTER
TOTALS = Player: 48          Computer: 0
4 , 8
7 , 1
1 , 9
5 , 4
4 , 2
TOTALS = Player: 48          Computer: 45

---------- PLAYER
TOTALS = Player: 48          Computer: 45
0: HOLD / 1: ROLL
Enter choice: 1

4 , 10
Roll total: 14
TOTALS = Player: 48          Computer: 45
0: HOLD / 1: ROLL
Enter choice: 1

10 , 4
```

```
Roll total: 14
TOTALS = Player: 48          Computer: 45
0: HOLD / 1: ROLL
Enter choice: 0

Holding...

---------- COMPUTER
TOTALS = Player: 76          Computer: 45
5 , 10
2 , 2
Doubles! Round score reset, turn forfeited.
TOTALS = Player: 76          Computer: 45

---------- PLAYER
TOTALS = Player: 76          Computer: 45
0: HOLD / 1: ROLL
Enter choice: 1

2 , 1
Roll total: 3
TOTALS = Player: 76          Computer: 45
0: HOLD / 1: ROLL
Enter choice: 1

8 , 1
Roll total: 9
TOTALS = Player: 76          Computer: 45
0: HOLD / 1: ROLL
Enter choice: 0

Holding...

---------- COMPUTER
TOTALS = Player: 88          Computer: 45
7 , 4
7 , 1
8 , 10
8 , 5
Unlucky number 13! Total score reset, turn forfeited.
TOTALS = Player: 88          Computer: 0

---------- PLAYER
TOTALS = Player: 88          Computer: 0
0: HOLD / 1: ROLL
Enter choice: 1

3 , 8
Roll total: 11
TOTALS = Player: 88          Computer: 0
0: HOLD / 1: ROLL
Enter choice: 0

Holding...
```

```
---------- COMPUTER
TOTALS = Player: 99          Computer: 0
8 , 1
9 , 2
10 , 6
9 , 5
TOTALS = Player: 99          Computer: 50

---------- PLAYER
TOTALS = Player: 99          Computer: 50
0: HOLD / 1: ROLL
Enter choice: 1

2 , 10
Roll total: 12
TOTALS = Player: 99          Computer: 50
0: HOLD / 1: ROLL
Enter choice: 0

Holding...

PLAYER WINS!
TOTALS = Player: 111         Computer: 50
```