Java Programming Notes

Hia Al Saleh

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Contents

1 Repetition Structures

1.1 Topics

- Sentinel values
- While Loop
- For Loop
- Do While Loop
- Nested Loops
- Boolean Conditions

1.2 Creating a new project in IntelliJ

Steps to create a new Java project:

1. Open IntelliJ and select `File > New > Project`.
2. Select `Java Project` and choose `SDK 1.8`.
3. Name the project **RandomGame**.

1.3 Generating Random Numbers

To generate random numbers in Java:

- Create a random object using `Random()`.
- Seed the random object using the current time in milliseconds.
- Use `random.nextInt(n)` to generate numbers between 0 and n-1.

```
import java.util.Random;
import java.util.Scanner;

public class EasterEggGame {
    public static void main(String[] args) {
        final Boolean DEBUG = false;
        Scanner input = new Scanner(System.in);
        Random random = new Random();
        int totalScore = 0;
        int difficulty;
        //Welcome user to the game and ask them for
            difficulty level
        System.out.println("Welcome to the ultra secret
            guessing game.");
        do {
```

```
            System.out.println("Please select a difficulty
                \n" +
                    "1) Easy (1-10)\n" +
                    "2) Medium (1-25)\n" +
                    "3) Hard (1-50)\n");
            //Accept user input for difficulty level

             difficulty = input.nextInt();
        } while (difficulty > 3 );
        //Ask the user the number of rounds, take as input
        System.out.println("How many rounds would you like
             to play?");
        int numOfRounds = input.nextInt();
        // PER ROUND:
        for (int i =0; i< numOfRounds; i++){
            int winningNumber=0;
            //  Generate proper random answer based on
                difficulty level
            switch (difficulty){
                case 1: winningNumber = random.nextInt(10)
                    +1;
                        break;
                case 2: winningNumber = random.nextInt(25)
                    +1;
                        break;
                case 3: winningNumber = random.nextInt(50)
                    +1;
                        break;
            }
            //  Ask user for number guess until correct
            int userChoice;
            int guesses=0;
            if(DEBUG) {
                System.out.println("DEBUG - " +
                    winningNumber);
            }
            do{
                System.out.println("Please enter your
                    guess: ");
                userChoice = input.nextInt();
                guesses++;
            } while (userChoice!=winningNumber);
            //  Add score to total score
            totalScore+=guesses;
            System.out.println("It took "+guesses+" to
                guess the number");
        }

        //Display Total Score (lower is better)
        System.out.println("Total score: "+totalScore);
```

```
    }
}
```

1.4 Repetition Structures

Three main types of loops:

- **For Loop**: Used for executing code a set number of times.
- **While Loop**: Executes code while a condition is true.
- **Do While Loop**: Similar to the while loop, but guarantees execution at least once.

```
    public class DoWhile {
    public static void main(String[] args) {
        int number = 10;
        do{
            System.out.println("Do While " + number);
        }while (number < 9);

        while (number <9){
            System.out.println("while "+number);
        }
        /*
        while (number < 20){
            System.out.println("while "+number);
            number++;
        }*/
    }
}
```

1.5 Boolean Conditions

- Loops often rely on Boolean conditions to determine when to stop executing.
- Boolean expressions return either `true` or `false`.

2 TestRandom

```
import java.util.Random;

public class TestRandom {
    public static void main(String[] args) {
        Random rand = new Random();//new Random(20);
```

```
        System.out.println(rand.nextInt());
        //System.out.println((rand.nextInt(10)+1)); //1-10
        //System.out.println(rand.nextInt(31)+20); //20-50
        for (int i = 0;i<10;i++){
            System.out.println(i+" - "+(rand.nextInt(31)
                +20)); //20-50
        }
        int randomNum;
        do {
            randomNum = rand.nextInt(31) + 20;
            System.out.println(randomNum);
        } while (randomNum >= 20);
    }
}
```

Homework

- Read Chapter 5 of the textbook.
- Test the Random Game program for generating random numbers and tracking user scores.

Next Week

Topics include:

- Repetition structures
- Sentinel values
- Nested loops
- Boolean conditions
- String manipulation