

Decomposition

CSC 210 Practice Exercises

Refactor the code below into classes and methods, following the principles of encapsulation.

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

public class GuessGame {

    public static void main(String[] args) {
        Scanner userInput = new Scanner(System.in);
        Random random = new Random();
        int number = random.nextInt(10);

        boolean keep_playing = true;
        int tries = 1;
        while (keep_playing) {
            System.out.print("Enter a number between 0 and 9: ");
            int guess = userInput.nextInt();
            if (guess == number) keep_playing = false;
            else tries++;
        }
        System.out.println("Game ended with " + tries + " tries.");
        userInput.close();
    }
}
```

Answer

```
import java.util.Random;

public class Game {
    private int number;
    private int tries = 1;
    private boolean over;

    public Game(int n) {
        Random random = new Random();
        number = random.nextInt(n);
        over = false;
    }

    public int getNumber() {
        return number;
    }

    public void increaseTries() {
        tries++;
    }

    public int getTries() {
        return tries;
    }

    public void checkGuess(int guess) {
        if (guess == number) over = true;
    }

    public boolean isOver(int guess) {
        checkGuess(guess);
        return over;
    }
}
```

```
import java.util.Scanner;

public class GuessGame {

    public static int getUserGuess(Scanner userInput) {
        System.out.print("Enter a number between 0 and 9: ");
        return userInput.nextInt();
    }

    public static void main(String[] args) {
        Scanner userInput = new Scanner(System.in);
        Game game = new Game(10);

        boolean keep_playing = true;
        while (keep_playing) {
            int guess = getUserGuess(userInput);
            if (game.isOver(guess)) keep_playing = false;
            else game.increaseTries();
        }
        System.out.println("Game ended with " + game.getTries() + " tries.");
        userInput.close();
    }
}
```