Bug 3

Odds in the game do not appear to be correct.

Sample Buggy Output

76 turns later. End Game 99: Fred now has balance 200 Win count = 3877, Lose Count = 5745, 0.40	62 turns later. End Game 99: Fred now has balance 200 Win count = 4289, Lose Count = 6771, 0.39
136 turns later. End Game 99: Fred now has balance 200 Win count = 5922, Lose Count = 3922, 0.60	152 turns later. End Game 99: Fred now has balance 200 Win count = 3423, Lose Count = 4998, 0.41

H1. The bug is somewhere in the rolling of the dice. So within `public DiceValue roll()` function of the Dice class.

Test	Place a breakpoint on line 37 `d.roll();`
Prediction	The dice isn't a fair dice and not returning truly random faces.
Result	The dice values seem to be random.
Notes	• There is something wrong with `DiceValue.getRandom();` it seems that SPADE is never returned. • `RANDOM.nextInt(DiceValue.SPADE.ordinal());` value is too low. It needs to be 1 above the value of `DiceValue.SPADE.ordinal()`

H2. Given than spades aren't being returned which would change dice odds, in turn changing the game odds.

Test	Add 1 to `DiceValue.SPADE.ordinal()`. Line 26 is of `DiceValue` is now `int random = RANDOM.nextInt(DiceValue.SPADE.ordinal() + 1);`
Prediction	The odds should be 0.42
Result	The odds are 0.50

	`228 turns later.`
	`End Game 99: Fred now has balance 200`
	
	`Win count = 18422, Lose Count = 18502, 0.50`

Notes	• Is that another bug that wasn't in the bug report? Or Just part of this bug? Adding it as another bug anyway.

H3. Now that the dice is fair and rolling correctly. But the odds are still not correct, perhaps the returned value from dice.getValue()

Test	Put a breakpoint on line 38 of Game `if (d.getValue().equals(pick)) {` Check if the returned value of `getValue` is incorrect and `pick` is incorrect.
Prediction	Returned value of `getValue or pick` is incorrect.
Result	N/A
Notes	• Noticed that when the dice is rolled the value is returned and not stored in value. Added `value = DiceValue.getRandom();` to roll function.

H4. Should work now.

Test	Run the games
Prediction	Odds should be 0.42% aprox.
Result	Odds are 0.42%
	92 turns later. End Game 99: Fred now has balance 200 Win count = 11192, Lose Count = 15423, 0.42
Notes	• N/A

Sample Fixed Output

142 turns later. End Game 99: Fred now has balance 200 Win count = 11062, Lose Count = 15185, 0.42	72 turns later. End Game 99: Fred now has balance 200 Win count = 9711, Lose Count = 13450, 0.42
64 turns later. End Game 99: Fred now has balance 0 Win count = 10844, Lose Count = 14763, 0.42	444 turns later. End Game 99: Fred now has balance 0 Win count = 10102, Lose Count = 14080, 0.42

Before and after screen shot of the bug.

```
public DiceValue roll() {
    return DiceValue.getRandom();
}
```

```
public DiceValue roll() {
    value =  DiceValue.getRandom();
    return DiceValue.getRandom();
}
```