Unit 7

- Short-Circuit Evaluation
  - De Morgan's Laws
- The `switch` statement
  - Type-casting in Java
- Using `Math.random()`

Short-Circuit Evaluation

if (*condition1* **&&** *condition2*) ...

If *condition1* is false, then *condition2* is not evaluated (the result is false anyway)

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if (*condition1* || *condition2*) ...

If *condition1* is true, then *condition2* is not evaluated (the result is true anyway)

De Morgan's Laws

One could think of it as the "Distributive Property" for Logic

! (p **&&** q) evaluates to (!p || !q)

! (p || q) evaluates to (!p **&&** !q)

The `switch` Statement

```
switch (expression)
{
   case value1:
      ...
      break;

   case value2:
      ...
      break;
   ...
   ...
   default:
      ...
      break;
}
```

switch
case
default
break

Reserved words

Only works with:
- int
- char
- enum

Don't forget **break**s!

The `switch` Statement (cont'd)

- The same case can have two or more labels. For example:

```
switch  (num)
{
   case 1:
   case 2:
      System.out.println("Buckle my shoe");
       break;
    case 3:
    case 4:
      System.out.println("Shut the door");
       break;
…
```

The Cast Operator

• Java allows a programmer to "cast" a piece of data to a different type when needed.

• Can be useful if working with `int` values and a decimal result is needed.

For example, one might want the decimal equivalent of a fraction even though the numerator and denominator are integers.

Example:

```
decAnswer = (double)myNumerator /
                    (double)myDenominator;
```

Math.random()

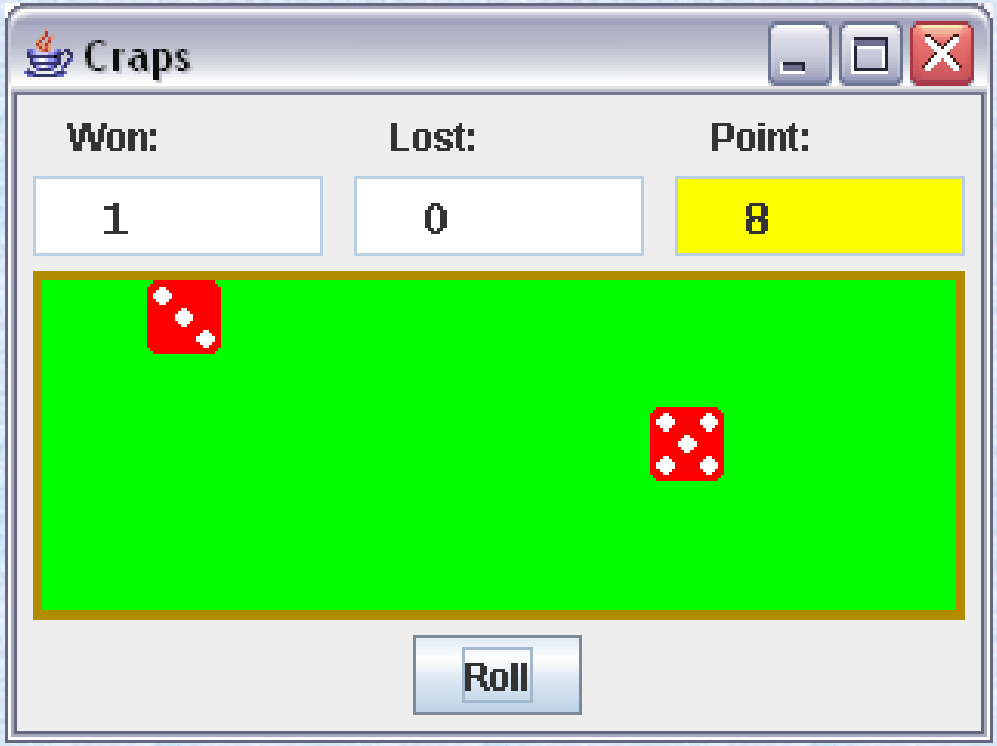
- returns a `double` value 0 ≤ x < 1

- Can then be scaled to fit the needs of your application.

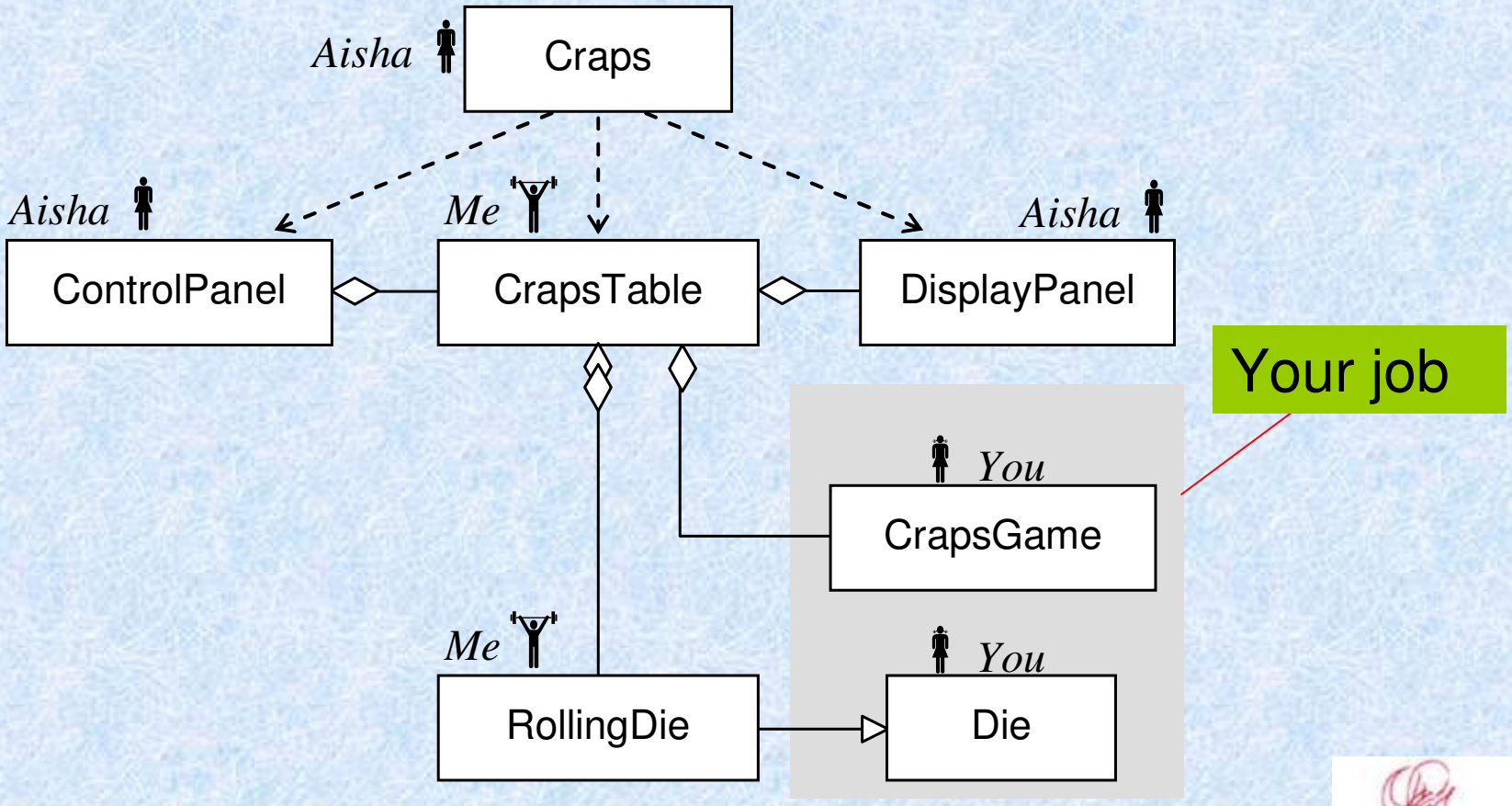
- For example, if you needed a random number from 1 to 12, you would do something like this:

randNum = (int) (12 * Math.random()) + 1;

The *Craps* Project



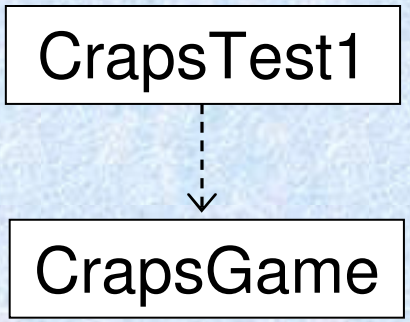
The *Craps* Project (cont'd)

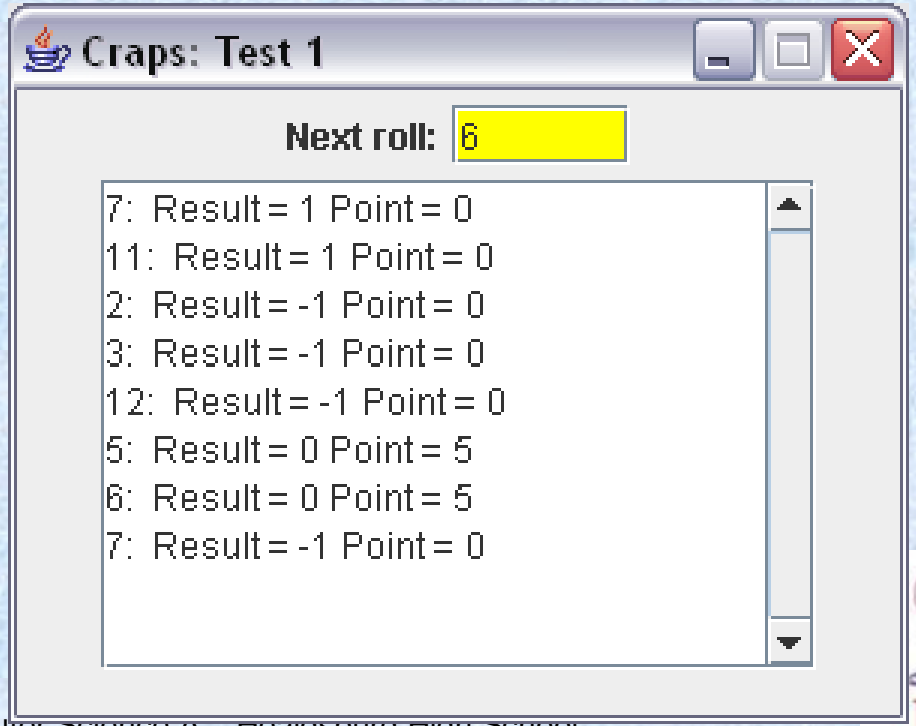


The *Craps* Project (cont'd)

Step 1:

Test your **CrapsGame** class separately using the class **CrapsTest1** provided to you.

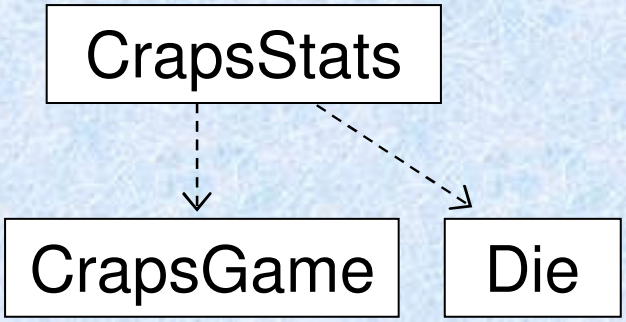




The *Craps* Project (cont'd)

Step 2:

Use your **Die** and **CrapsGame** classes in the **CrapsStats** application.



The *Craps* Project (cont'd)

Step 3:

Finish the **RollingDie** class (the **drawDots** method). Integrate **CrapsGame** and **RollingDie** into the *Craps* program.