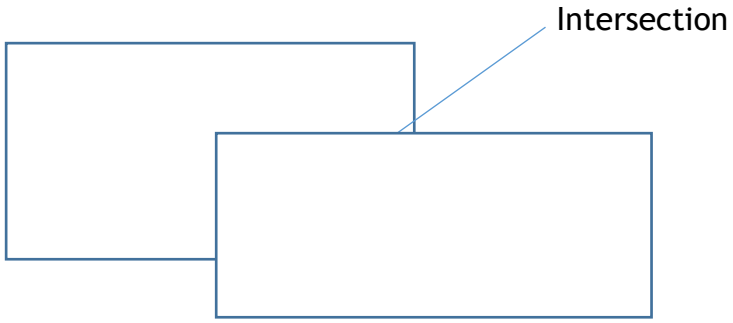
1. Write a program which instantiates a new `Rectangle` object. Use appropriate methods to set its instance variables to values entered by the user. Use an appropriate method to move the `Rectangle` a distance of 50 to the right and 70 downwards, and output the values of each instance variable.

2. The `intersection()` method computes the intersection of two `Rectangle`s – that is, the rectangle that is formed by two overlapping `Rectangle`s.




   Write a program that constructs two `Rectangle` objects, prints their details, and then prints details of the `Rectangle` object that describes the intersection. What happens when the `Rectangle`s do not overlap?

3. Find a method that will determine whether two `Rectangle`s intersect. Write a program that constructs two `Rectangle` objects, displays their values on screen and determines if the objects intersect. If they intersect, the program should display the instance variables of the new `Rectangle` created by the intersection.

4. Write a program that uses the `isEmpty()` method to determine whether or not a `Rectangle` encloses no space. Test this method on `Rectangle`s with the following values:

```
Height = 0, Width  = 0
Height = 1, Width  = 0
Height = 0, Width  = 1
Height = 1, Width  = 1
```

   Based on your findings, how do you think this method works?

5. Write a program that uses the `equals()` method to determine whether or not two `Rectangle`s are the same. How do you think this method works?

6. The `Random` class implements a random number generator, which produces sequences of numbers that appear to be random. To generate random integers, you construct and object of the `Random` class, and then apply the `nextInt()` method. For example, the call `generator.nextInt(6)` will give you a random number between 0 and 5, where `generator` is an object of type `Random`. Write a program that uses the `Random` class to simulate the cast of a die (dice), printing a random number between 1 and 6 every time that the program is run. You will need to import `Random` from the package `java.util`.