AP Computer Science Name: ____________________________________
Karel Chapter 6 Notes (1)

INSTRUCTIONS THAT REPEAT

Integers:

`int` variable: Represents a subset of the integers of mathematics. The range of allowed values is from approximately -2 billion to +2 billion or from -2^{31} to $+2^{31}$.

You declare a variable:	`int x;`
Then, you initialize it:	`x = 5;`
Later, you reassigns values to it:	`x = 7;`
To increment by one:	`x++;  // now x is 8`

Note: It isn't often necessary to know this, but if you increment the largest positive value, you get the smallest negative one.

The FOR-LOOP Instruction:

```
public class BeeperController extends Robot
{
     public void turnRight()
     {
          for (int i = 0; i<3; i++)
          {
               turnLeft();
          }
     }

     …
}
```

Nested FOR-LOOPs:

Example: Write a method called `walkSquareOfLength_6` which has a robot move in a 6x6 square.

The WHILE Instruction:

```
public class BeeperController extends Robot
{
     public void goToBeeper()
     {
          while(! nextToABeeper())
          {
               move();
          }
          pickBeeper();
     }

     …
}
```

Example: Using a WHILE loop, write a method called `clearCornerOfBeepers`, which will pick up all beepers from the corner that karel is on regardless of how many beepers are on the corner.

Four Steps to Building a WHILE Loop:

1. Identify the one test (predicate) that must be true when karel is finished with the loop.

2. Use the opposite form of the test identified in step 1 as the loop<test>.

3. Within the WHILE, make progress toward completion of the WHILE. We need to do something within the WHILE to ensure that the test eventually evaluates to false so that the WHILE loop stops. Often it is helpful to do the minimum amount of work that is necessary to advance toward completion of the task.

4. Do whatever is required before or after the WHILE instruction is executed to ensure we solve the given problem.

AP Computer Science
Karel Chapter 6 Practice

Name: ________________________________

1. A robot named karel is somewhere in the world facing south. One beeper is on each corner between karel's current position and the southern boundary wall. There is no beeper on the corner on which karel is currently standing. Write a new method, `clearAllBeepersToTheWall`, to pick all the beepers.

2. A robot named karel is somewhere in the world with many lines of beepers to be harvested. Write a method using a loop named `harvestLine` that will pick up all beepers in any one given row of any size and with any number of beepers on any given corner.