Decoding and Encoding Messages

Background Information

A char is a primitive data type that represents one alpha-numeric character. A character is really an integer that is mapped one-to-one to some table of characters. ASCII is the original character encoding scheme, and is still in use today for most Roman alphabet languages, including English. (The system of character encodings called UNICODE has integer-to-character mappings for most languages in the world. For English, UNICODE and ASCII are pretty much identical. Look online for an ASCII table to see the mapping.)

A variable of type char holds one and only one character. It can be given values either as a character or as an integer.

Example:
```java
char foo = 'a'; // note the single quotes for a char;
               // double-quotes indicate a string
char bar = 97;  // makes bar the character code 97,
                // which is the letter a
```

A String is a data type that holds a collection of chars. Note the capital S on String, which indicates that it is actually a class, not a primitive data type.

Strings can be composed a number of ways, many of which will look familiar from System.out.println() statements.

Example:
```java
String foo = "";  // declares an empty string
foo = "Hello there"; // assigns a literal string to the
                     // variable
foo = foo + ", Ms. B. "; // use "+" to concatenate
                       // strings

String bar= "How are you?"; // another string
foo += bar; // can also use "+=" to
            // concatenate strings

char someChar = 98; // make a character
foo := someChar; // tack it onto the end of foo

// foo is now = "Hello there, Ms. B. How are you?"
```
Part 1: DecoderBot

Your robot is in a world that has been encoded with beepers. The code represents a string of characters. The characters have been encoded by placing piles of beepers along street 1 of the world, where the number of beepers in each pile indicates the ASCII code for a character in the encoded message. Your robot must decode the entire message, reading west to east. The end of the message is indicated by a corner with no beepers on it.

For example, the following world encodes the message "Hello":

In decoding your message, you must print the final message as output to the console: *it must be the last thing printed to the console.*

In designing your solution, you must extend SuperBot but you may not change SuperBot in any way.

BEFORE YOU BEGIN, ANSWER THE QUESTIONS ON THE NEXT PAGE AND HAVE YOUR DESIGN APPROVED BY A TEACHER!

SEE THE NEXT PAGE FOR DETAILS
Assume that your robot already knows how to decode a single character, using a method called decodeChar() that counts the number of beepers on a corner and returns the ASCII character equivalent.

Now that you have decodeChar() available, you will design a method in which the robot will travel across a row of beeper piles, decoding as it goes. Before you begin, answer these questions:

1. What will you name this method? __________________________

2. Will you use (circle one): a WHILE LOOP a FOR LOOP RECURSION

3. You must build up a string, one char at a time. You'll probably need a variable to hold the string. What are you going to call it? __________

4. Write a single line of code that calls decodeChar() and appends the char to your string.

5. Now write the method that you named in question 1:

6. Finally, fill in the body of the decodeChar() method:

   public char decodeChar(){

   }

THIS MUST BE APPROVED BEFORE YOU PROCEED