What is Geocaching?

Geocaching (pronounced geo-cashing) is a worldwide game of hiding and seeking treasure. A geocacher can place a geocache in the world, pinpoint its location using GPS technology and then share the geocache's existence and location online. Anyone with a GPS device can then try to locate the geocache. (Source: www.geocaching.com)

A traditional geocache is a container that contains at least some paper for visitors to sign to log their visit. The container could be a Tupperware container, a military surplus ammo box, or a film canister. If the cache is large enough, it will typically contain small tradable items. In general, if you take an item from a cache, you should leave one of similar value.
Part 1: Geocaching Simulation

You will be simulating a geocaching experience on paper. On your map, white squares represent clear land, green squares represent land covered with trees, and brown squares represent land densely covered with trees.

Choose one partner to act as a geocacher and one to act as a GPS. Choose your roles to receive further instruction.

After you complete all 3 maps, discuss the difficulties you encountered in the experience. What strategies were the most useful for finding the geocache?

Part 2: Rot13 Encryption

The purpose of geocaching for most is the enjoyment of searching for and (hopefully) finding the geocache. Many geocache owners give two levels of hints to the location in their descriptions of their geocaches. The official geocaching website, geocaching.com, allows geocache owners to give “Additional Hints” that are encrypted using a method called Rot13. This way, the information is available for those who want it, but it remains unreadable at a glance for those who want a greater challenge.

Rot13 shifts each letter by 13 characters as seen below (from geocaching.com):

<table>
<thead>
<tr>
<th>Decryption Key</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
</tr>
<tr>
<td>----------------</td>
</tr>
<tr>
<td>N</td>
</tr>
</tbody>
</table>

(letter above equals below, and vice versa)

Snarf the geocaching encryption project. In the Encoder class, write the `encode` method. When you complete this method, the program will run from the `Main` class and you will be able to insert text in the text area and encode/decode it. Be sure to encode both capital and lowercase letters.
Hint: Chars can be modified based on their numerical equivalents, with uppercase letters numbered sequentially as 65-90, and lowercase letters 97-122. To modify a char, add an int to it and the char will shift by that much (e.g., A+13=N). A char cannot be modified and inserted on a String on the same line; it will convert to its number equivalent. However, a char can be modified by adding a number to it, and then that char can be concatenated onto a String.

**Part 3: Find a Geocache!**

Of course, the simulation from Part 1 was only accurate to an extent. In real life, your GPS will not know where the geocache is, and you will have to do some searching for the actual container once you find the right area.

Use your Rot13 program to decode the following message (copy and paste from the class site):

Pbatenghyngvbaf ba pbzcyrgvat lbhe Ebg13 cebtenz. Abj, pubbfr n tebhc yrnqre jub jvyy hfr gur TCF gb thvqr lbh gb gur trbpnpur ybpngrq ng gurfr pbbeqvangrf:

A 36º00.301’
J078º56.485’

Gurfr pbbeqvangrf ner cer-cebtenzzrq vagb gur TCF. Tb bhgfvqr naq frnepu sbe gur trbpnpur. Gur pnpur pbagnvare vf n pyrne cynfgvp pbagnvare jvgu n terra yvq, uvqqra va gur cynagf arkg gb gur fgbar ergnvavat jnyy.

**Decoded message:**

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Megan Heysham
Image sources: geocaching.com, cafepress.com, xkcd.com
Assignment

How did your actual geocaching experience compare to the simulated one? How closely did the simulation model real-life geocaching, and why?