Announcements

- Homework 3 due today
- Build your GUI before this week's lab
- Another debugging tutorial in lab this week (Debugging Loops)
- NO LABS NEXT WEEK!
Review

- Loops
  - Counting loops
  - Input loops
  - String processing loops
Today’s Plan

- Ethernet
As for Bell's first telephone lines, they were as simple as clotheslines. Each short little wire stood by itself, with one instrument at each end. ... There were no switchboards of any account, no cables of any value, no wires that were in any sense adequate, no theory of tests or signals, no exchanges, no telephone system of any sort whatever.

But there had now come a time when more than two persons wanted to be in the same conversational group. ... Here was the new problem, and a most stupendous one -- how to link together three telephones, or three hundred, or three thousand, or three million, so that any two of them could be joined at a moment's notice.

And that was not all. ... They had to make this system so simple and fool-proof that every one ... could use it without any previous experience.
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### Ethernet Frame Format

<table>
<thead>
<tr>
<th>PREAMBLE</th>
<th>TO</th>
<th>FROM</th>
<th>LENGTH/TYPEx</th>
<th>DATA</th>
<th>ERROR CHECK</th>
</tr>
</thead>
<tbody>
<tr>
<td>64</td>
<td>48</td>
<td>48</td>
<td>16</td>
<td>between 46 and 1500 bytes</td>
<td>32</td>
</tr>
</tbody>
</table>

*Note: The values provided are examples and may not reflect actual specifications.*
# 802.11 (WiFi) Frame Format

<table>
<thead>
<tr>
<th>Frame Control</th>
<th>Duration</th>
<th>Addr 1</th>
<th>Addr 2</th>
<th>Addr 3</th>
<th>Sequence Control</th>
<th>Addr 4</th>
<th>Data</th>
<th>Error Check</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>16</td>
<td>48</td>
<td>48</td>
<td>48</td>
<td>48</td>
<td>16</td>
<td>32</td>
<td></td>
</tr>
</tbody>
</table>

- up to 2312 bytes

Sunday, October 4, 2009
ETHERNET TRANSMISSION ALGORITHM

READY TO SEND

NETWORK BUSY

NETWORK IDLE

SENDING + LISTENING

> 2 PROP TIMES ELAPSED

COMPLETE TRANSMISSION, RESET DELAY RANGE

JAM, WAIT RANDOM # OF SLOTS, DOUBLE DELAY RANGE

DELAY ELAPSED

COLLISION DETECTED

WAITING FOR TRANSMISSION END

Sunday, October 4, 2009
AMAZING ANIMATED DEMONSTRATION!!!

http://www.cs.williams.edu/~cs134/lectures/etherDemo.html
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