ECE2030b- HW-7 Due Wednesday Dec. 5, 2002 – Memory, Assembly

Memory.

A. Complete the table below. A “2M x 16” memory has 2M words of 16 bits.

<table>
<thead>
<tr>
<th>Memory</th>
<th>Total Bits</th>
<th># of addresses</th>
<th># of address lines</th>
<th># of data lines</th>
</tr>
</thead>
<tbody>
<tr>
<td>1M x 8</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1K by 4</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>64K x 16</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4M x 32</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

B. Show how to connect these 1M x 16 chips to make a 1M by 32 memory.

C.
C. Show how to connect these 1M x 16 chips to make a 2M by 16 memory. The data outputs are three-state bus drivers.

![Diagram of memory chip connections]

**Assembly**. D. Write in R4000 assembly language the commands to do the following:

Compare two variables, X and Y. If X \( \geq Y \) then do a non-relative jump to the instruction whose address is in register \$5\. Use the SLT instruction.

X is in memory address 0x00002800. Y is in memory address 0x00003900.

```
loop:   add   $2, $3, $2
        beq   $2, $6, ________________
```

E. What is the offset address (in 19-bit hex) for the BEQ instruction below to branch back to label "loop"?