
2. Book problem 4.7

3. Book problem 4.8

4. Book problem 4.9

5. Assume the following data is in the memory locations specified:
   \[ x_{3000}: 0010 \ 0110 \ 1111 \ 1111 \]
   \[ x_{3100}: 0101 \ 0000 \ 1111 \ 0000 \]
   \[ x_{3101}: 0000 \ 0000 \ 1111 \ 1111 \]

   And that the following data is in the specified registers:
   \[ PC: 0011 \ 0000 \ 0000 \ 0000 \]

   What are the contents of the registers below after each phase of the Instruction Cycle (Fetch-Execute Cycle)? Show all values in hex. If you don’t know the value of something, mark it with a ‘?’.

<table>
<thead>
<tr>
<th>Fetch Instruction</th>
<th>Decode</th>
<th>Evaluate Address</th>
<th>Fetch Operands</th>
<th>Execute</th>
<th>Store Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>PC</td>
<td>IR</td>
<td>MAR</td>
<td>MDR</td>
<td>R3</td>
<td></td>
</tr>
</tbody>
</table>

6. For the instructions ADD, LDR, and STI, list which phases of the Instruction Cycle are used when performing each instruction.

7. Book problem 4.16