1. Under which conditions will the CSP command `west!count;` fail?
   
   a) If `west` terminates.

   b) If `counts` becomes undefined.

2. Consider a RAID-5 array having five data blocks, namely, `b_1`, `b_2`, `b_3`, `b_4`, and `b_5` and one parity block `p` per stripe.

   a) How many disk drives does it comprise? ___six___ drives

   b) Assuming that block `b_3` suddenly becomes unavailable, how could you reconstruct its contents?

   \[
   b_3 = b_1 \text{ XOR } b_2, \text{ XOR } b_4 \text{ XOR } b_5 \text{ XOR } p
   \]

3. Consider a multiple-ring Totem system consisting of three rings respectively named A, B and C. Assuming that a given processor has received messages with the following time stamps

<table>
<thead>
<tr>
<th>From ring</th>
<th>Messages sent at</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>4:25 PM, 5:05 PM</td>
</tr>
<tr>
<td>B</td>
<td>4:55 PM</td>
</tr>
<tr>
<td>C</td>
<td>4:35PM</td>
</tr>
</tbody>
</table>

   which messages will be delivered by the processor if all messages are agreed delivery messages and

   a) No guaranteed vector message was sent by any ring?

      It will deliver messages sent at 4:25 PM

   b) Each ring sent a guaranteed vector message at exactly 5:00 PM?

      It will deliver messages sent at 4:25 PM, 4:35 PM and 4:55 PM

4. What are the main advantage and the main disadvantage of using journaling with synchronous log updates compared to using soft updates?

   a) **Main advantage:**

      Durability of metadata updates: they are immediately stored in stable memory.

   b) **Main disadvantage:**

      High cost of the policy resulting in a lower performance of the file system.

5. How can Sprite LFS retrieve the contents of its i-node map when the system reboots after a crash?

   a) Retrieve from the checkpoint area the addresses of all i-node map blocks at checkpoint time.

   b) Scan the portion of the log containing the disk writes those happened after the checkpoint time and search for i-node map blocks.