

Exercises of lecture  
**Wireless Sensor Networks**  
Winter 2006/2007  
Sheet 7

**SECTION 1:**  
Synchronization

1. Given a wireless sensor network consisting of sensor node x and sensor node y that are designed to detect the same event at a fixed event rate.

After the initialization of the sensor node x, it detects:

- (a) a synchronization signal at 2.4s
- (b) an event at 2.5s

After the initialization of the sensor node y, it detects:

- (a) a synchronization signal at 1.9s
- (b) an event at 2.1s

Then, node y informs node x about the time it receives the first event. Assume that all the synchronization signals received by node x and y are based on the same global source, and both nodes are located at the same distance from the synchronization source, which node detects the event first? And how advanced or late this node detects the event compared to another?

2. An MS Project involves logging environmental events on different sensors during experiment and after the experiment presenting a list of logged data with corresponding logic time on PC. However the project does not covers clock synchronization. How can the MS student present reliable log data on PC without worrying about writing time synchronization code on the sensors? (Hint: He also logs the end time of experiment on each sensor).
3. Differentiate between external synchronization and internal synchronization