Exercise 3

1- Why do events require their occurrence time to be included? In which cases is it important? Provide an example.

The occurrence times of events are important in order to be able to order them in time in an event processing scenario. It can be important to be able to determine at which time an event was generated and whether it falls within a defined time interval, for example (e.g. restriction/determination of the validity of an event). In pattern matching the temporal correlation of events is important, for this the time of occurrence is also important.

2- Why do some events require spatial properties? (When is that used, provide examples).

Spatial information is a context dimension that an event can have and by which events can be grouped. For example, navigation systems send events that contain information about their position and also expect incoming events with spatial information.
Examples of spatial information include "3 miles from the traffic accident location" or "Within an authorized zone in a manufactory".

3- A data stream can contain punctuations. Define what punctuations are, and give an example of how they can be used.

Punctuations in a stream mark the end of substreams, allowing us to view an infinite stream as a combination of finite streams. A punctuation is a pattern p inserted into the data stream with the meaning that no data item i matching p will occur further on in the stream.
For example, a punctuation ({site8, site10}, 2000, ∗, [8:45p, 9:15p],∗) in the bid stream for an auction server signals that all bids from Sites 8 and 10 for auction item 2000 made during the 30-minute period starting at 8:45p have been seen.