In-Class Quiz 3 (Point Processes)

1. Explain what is an Evolutionary Point Process? What does the history $\mathcal{H}_t$ consist of in this type of point process?

2. As you know, $f^*(t) = f(t|\mathcal{H}_t)$ is the conditional density function of the time of the next event given the history of previous events. The conditional intensity function is also defined by

$$\lambda^*(t) = \frac{f^*(t)}{1 - F^*(t)} \tag{1}$$

   (a) Prove the following equation where $\mathrm{d}t$ is an infinitisemal interval around t:

$$\lambda^*(t)\mathrm{d}t = \mathbb{E}[N(\mathrm{d}t)|\mathcal{H}_t] \tag{2}$$

   (b) Considering the previous equation, interpret the conditional intensity function.