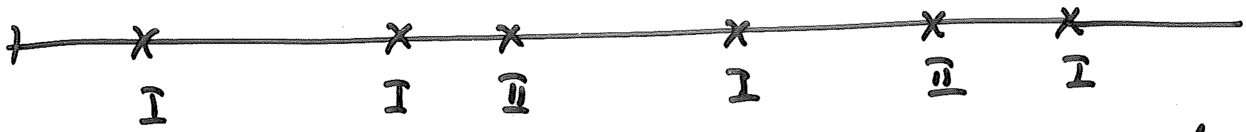

Let $N_1(t)$ denote the no. of events of type I in $(0, t]$ and $N_2(t)$ the no. of type II events.

Then $N(t) = N_1(t) + N_2(t)$

<u>Prop. 5.2.</u> $N_1(t), t \geq 0$ and $N_2(t), t \geq 0$ are both Poisson processes with rates λp and $\lambda(1-p)$, respectively. Furthermore, they are <u>independent</u>.

N_1 (N_2) are <u>thinned</u> versions of N.

Pf. Check def. 5.3. for N_1:

- $N_1(0) = 0$ since $N(0) = 0$.
- $\mathbb{P}(N_1(h) = 1) = \mathbb{P}(N_1(h) = 1 \mid N(h) = 1) \cdot \mathbb{P}(N(h) = 1) = p \cdot (\lambda h + o(h)) = \lambda p h + o(h)$

$\mathbb{P}(N_1(h) \geq 2) \leq \mathbb{P}(N(h) \geq 2) = o(h)$

- $N_1(t)$ has stationary and independent