TMA4275 Life time analysis
Exercise 3, Spring 2021

Problem 1: Problem 2.9 in ABG.

Problem 2: Problem 2.10 in ABG.

Problem 3: Problem 2.11 in ABG.

Problem 4: Let $N(t)$ be the number of events up to (and including) time t in a homogenuous Poisson process with intensity $\lambda = 1$. Let $M(t) = N(t) - \lambda t$ and $N^\star(t) = \lambda t$ so that the Doob-Meyer decomposition of $N(t)$ is

$$N(t) = N^\star(t) + M(t).$$

Simulate the process $N(t)$ for $t \in [0, 25]$ and plot the resulting sample path. Plot also $N^\star(t)$ in the same figure as $N(t)$. In a seperate figure make a plot of the corresponding sample path of $M(t)$. Finally, make also plots of the corresponding sample path of $M^2(t)$ and λt (in the same plot) and (in a seperate plot) the sample path of the martingale $M^2(t) - \lambda t$.