Definition A.6

The **infinitesimal generator**, sometimes called simply the generator, denoted by $\mathcal{L}_t$ of a process X_t acts on functions which are twice differentiable in the following manner:

$$\mathcal{L}_t f(x) = \lim_{h \downarrow 0} \frac{\mathbb{E}\left[f(X_{t+h}|x_t = x\right] - f(x)}{h}.$$

The infinitesimal generator is the generalization of a derivative of a function to make it applicable to a stochastic process.