

Lemma 0.0.1 (a discrete time result). *Let $M = (M_n)_{n=0,1,\dots,N}$ be an \mathcal{F} -adapted and integrable stochastic process. Then M is an \mathcal{F} -martingale if and only if $\mathbb{E}(M_\tau) = \mathbb{E}(M_0)$ for any stopping time τ with values in $\{0, 1, \dots, N\}$.*