

$$\begin{aligned} M_0^P(B_t^i B_t^j) &= B_0^i B_0^j + \overbrace{M_0^P(B_0^i (B_t^j - B_0^j))}^0 + \overbrace{M_0^P(B_0^j (B_t^i - B_0^i))}^0 \\ &\quad + \underbrace{M_0^P(\Delta B^i \Delta B^j)}_0 \\ &= B_0^i B_0^j. \end{aligned}$$

So $B^i B^j$ is a martingale.