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Kalman Filter Update Equations

Time Update:

$$\hat{X}_k = X_{k-1} + U_{k-1}$$

$$P_k = P_{k-1} + Q$$

Measurement Update:

$$K_k = P_k (P_k + R)^{-1}$$

$$P_k = (I - K_k) P_k$$

$$\hat{X}_k = X_k + K_k (z - X_k)$$