1. predicted estimate: state $\hat{\mathbf{x}}_{k|k-1} = \mathbf{A}\hat{\mathbf{x}}_{k-1|k-1} + \mathbf{B}\mathbf{u}_{k-1}$

2. predicted estimate: state-covariance $\mathbf{P}_{k|k-1} = \mathbf{A}\mathbf{P}_{k-1|k-1}\mathbf{A}^T + \mathbf{Q}_k$

3. gain $\mathbf{K}_k = \mathbf{P}_{k|k-1}\mathbf{C}^T \left(\underbrace{\mathbf{C}\mathbf{P}_{k|k-1}\mathbf{C}^T + \mathbf{R}_k}_{\text{innovation: covariance}} \right)^{-1}$

4. updated estimate: state $\hat{\mathbf{x}}_{k|k} = \hat{\mathbf{x}}_{k|k-1} + \mathbf{K}_k \left(\underbrace{\mathbf{y}_k - \mathbf{C}\hat{\mathbf{x}}_{k|k-1}}_{\text{innovation: measurement}} \right)$

5. updated estimate: state-covariance $\mathbf{P}_{k|k} = (\mathbf{I} - \mathbf{K}_k\mathbf{C})\mathbf{P}_{k|k-1}$