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README - kf.pdf
Guidance, Navigation and Controls Subsystem

Function Name (Kalman Filter)

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Description:
The code implements the Kalman Filter Algorithm to estimate the state of a bot. It models motion of a bot performing SHM. It assumes initial position as origin and angular frequency of oscillation as unity. Here we the know the ideal trajectory of the bot and hence it plots it and randomly generates measurements around this trajectory.Then it implements the Kalman Filter Algorithm and estimates the state of the bot i.e its position and velocity. The code will not give accurate estimates for high value for initial covariances.
Formulae & References:
Theory of Kalman Filter Algorithm
Algorithm Derivation
Input parameters:
The input arguments to the code are as follows:

1. **velocity** : (Float) - initial velocity of the bot. *m/s*

2. **covariance** : (Float) - initial covariance of state.(If initial state is accurately known, type 0) m^2

3. **amplitude** : (Float) - amplitude of the oscillations. *m*

Output:
The code plots the state estimates of the trajectory, one curve showing the position and the other velocity as the state evolves.It also plots the covariance.