

Homework 3, Part B

Problem 1

Kalman filter Equations:

\bar{S}_t is the estimate value of state,

\hat{S}_t is a posteriori value of state.

Prediction:

$$\bar{S}_t = \hat{S}_{t-1} + \mu_e = \hat{S}_{t-1}$$

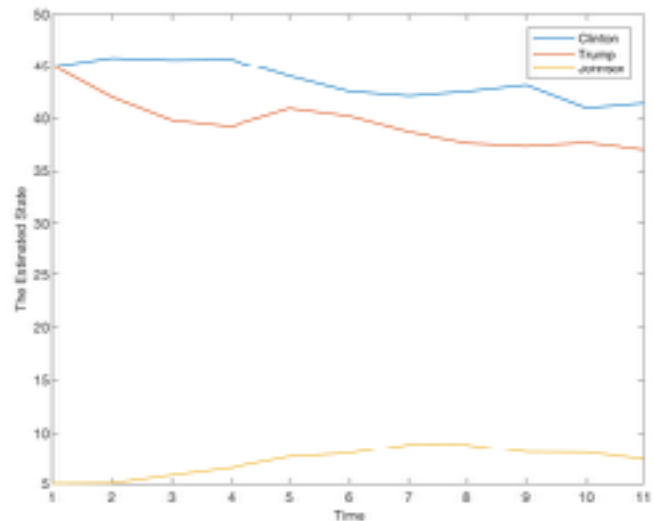
$$R_t = \Theta_e + \hat{R}_{t-1}$$

Update based on observation:

$$K_t = R_t A^T (A R_t A^T + \Theta_r)$$

$$\hat{S}_t = \bar{S}_t + K_t (O_t - A S_t - \mu_r)$$

$$\hat{R}_t = (I - K_t A) R_t$$



State

	1	2	3	4	5	6	7	8	9	10	11
Clinton	45.00	45.82	45.63	45.68	43.95	42.48	42.05	42.45	43.07	40.91	41.35
Trump	45.00	41.95	39.74	39.15	40.87	40.14	38.66	37.59	37.31	37.63	36.98
Johnson	5.00	5.03	5.80	6.48	7.56	7.88	8.86	8.84	8.02	7.97	7.34

Final State Uncertainty

	0.26	0.00	0.00
	0.00	0.22	0.00
	0.00	0.00	0.19

Problem 2

The accuracy is 86.41%.