ASP 2.

Autoregressive process by the difference eq: $d(n) = 0.75\,d(n-1) + v(n)$

and noisy process $u(n) = d(n) + w(n) + 0.5\,w(n-1)$

- Calc by hand :, expressions for optimal set of weights and obtain values of the optimal weights.

$$\frac{\partial J}{\partial w_0} = -2E[\underbrace{(d(n) - w_0 u(n) - (w_1 \cdot u(n-1))}_{e}) u(n)] = 0$$

general

$$\nabla_k J = -2E[u(n-k)e^*(n)]$$

?

$$\frac{\partial J}{\partial w_1} = -2E[\underbrace{(d(n) - w_0 u(n) - w_1 v(n-1))}_{e \text{ from slides}} \cdot u[n-1]] = 0$$

$$\Rightarrow \frac{\partial J}{\partial w_0} = w_0 r(0) + w_1 r(1) = P(0)$$

$$\Rightarrow \frac{\partial J}{\partial w_1} = w_0 r(1) + w_1 r(0) = P(1)$$