MA 381, HW #4 Solutions

#1 (#1, pg. 105)

$P(\text{dot}) = .4 \qquad P(\text{dash}) = .6$

$P(\text{dash received} \mid \text{dot sent}) = .25$

$P(\text{dot} \quad " \quad \mid \text{dash} \quad ") = .33$

$P(\text{dot sent} \mid \text{dot received})$

$$= \frac{P(\text{dot received} \mid \text{dot sent})\, P(\text{dot})}{P(\text{dot received} \mid \text{dot sent}) \cdot P(\text{dot}) + P(\text{dot} \mid \text{dash}) \cdot P(\text{dash})}$$

$$= \frac{(1 - 0.25)(.4)}{(1 - 0.25)(.4) + .33(.6)} \doteq 0.602$$

#2 (#4, pg. 106)

$P(\text{Susan guilty}) = .65 = P(g)$

$P(\text{conflicting testimony} \mid \text{Susan guilty}) = P(c|g)$

$= .25$

$P(c|g^c) = .30$

$$P(g|c) = \frac{P(c|g) \cdot P(g)}{P(c|g) \cdot P(g) + P(c|g^c) \cdot P(g^c)}$$

$$= \frac{.25(.65)}{.25(.65) + .30(.35)} \doteq .607$$