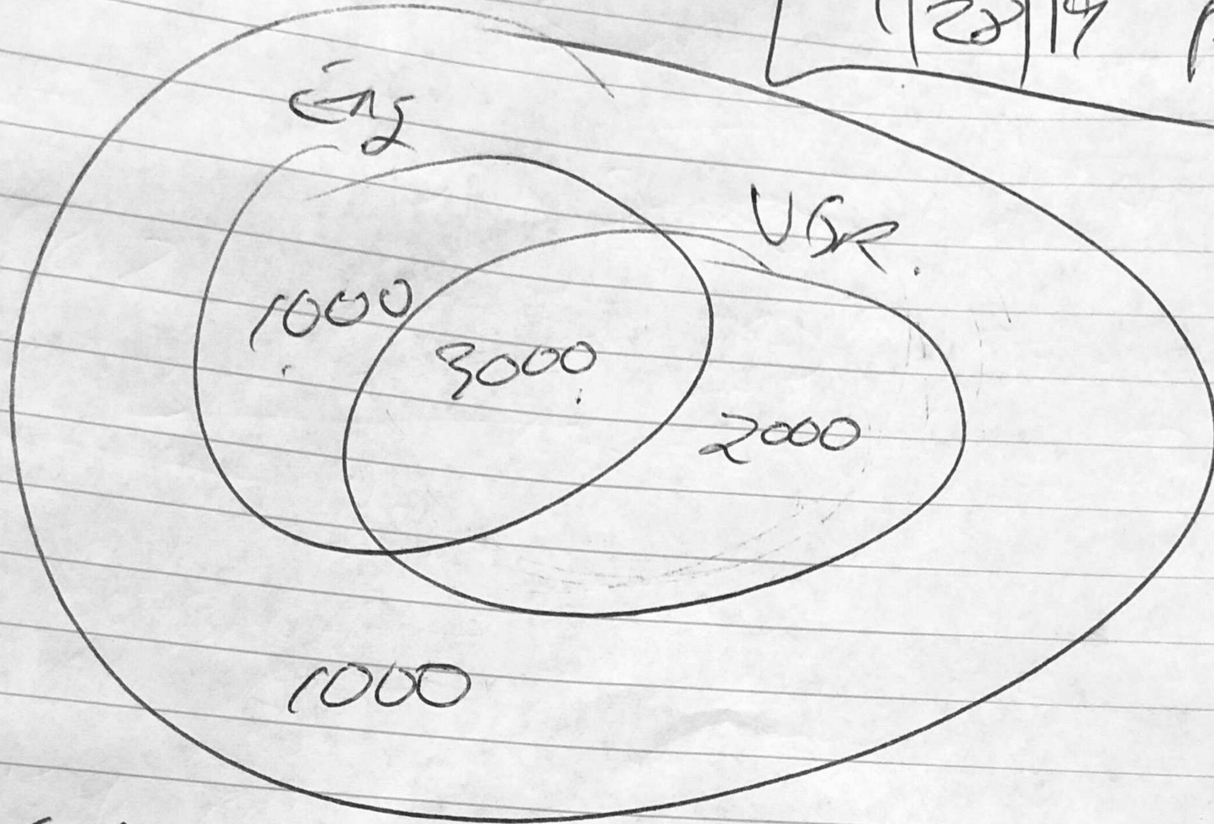
1/22/19 P1



$P(En) = \frac{4000}{7000}$

$P(En \& Ug) = \frac{3000}{7000}$

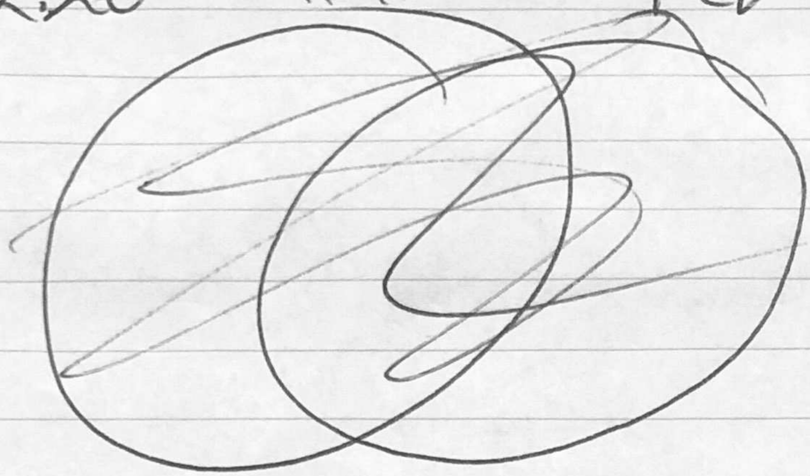
$P(En | Ug) = \frac{3000}{5000} = \frac{P(En \& Ug)}{P(Ug)}$

$P(En | Gr) = \frac{P(En \& Gr)}{P(Gr)} = \frac{1000}{2000}$

$P(Sc | Ug) = \frac{P(Sc \& Ug)}{P(Ug)} = \frac{2000}{5000}$

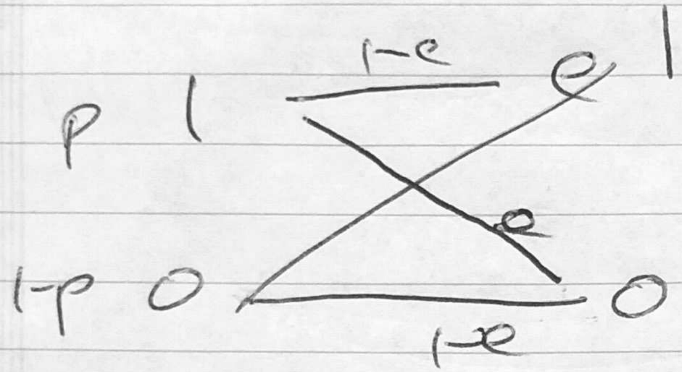
$P(\sout{En}\ Sc | Gr) = \frac{P(\sout{En}\ Sc \& Gr)}{P(Gr)} = \frac{1000}{\ }$

EX 2.26 XMIT RCV



Xm Rc

P(0 0)



$P(00) = (1-p)(1-e)$

$P(01) = (1-p)e$

$P(10) = pe$

$P(11) = p(1-e)$

P(BIT ARRIVED OK) $= (1-p)(1-e) + p(1-e) = 1-e$

$$P(Rc1 | Xm1) = \frac{P(Rc1 \,\&\, Xm1)}{P(Xm1)} = \frac{p(1-e)}{p}$$

WHAT I WANT IS $P(Xm1 | Rc1)$

BAYES RULE

BAYES

$$P(X_{m1} | R_{c1}) = \frac{P(X_{m1} \& R_{c1})}{P(R_{c1})}$$

$$P(R_{c1}) = P(X_{m1} \& R_{c1}) + P(X_{m0} | R_{c1})$$

$$p(1-e) + (1-p)e$$

$$= p - pe + e - pe = p + e - 2pe$$

$$\rightarrow P(X_{m1} | R_{c1}) = \frac{p(1-e)}{p+e-2pe}$$

EX $p = .5$, $e = .1$ $\quad \frac{.45}{.5} = .9$

EX 2 $p = .9$, $e = .1$ $\quad \frac{.81}{~~.81~~\ .82} = .99$

$p = .1$ $e = .1$ $\quad \frac{.09}{.18} = .5$