

1.2.2
 Prior probability = $\hat{\eta}_i = \frac{\eta_i p_i}{\sum \eta_i p_i}$

From this, we get

$$r(x, x') = \hat{\eta}_1(n) \hat{\eta}_2(x'_n) + \hat{\eta}_2(n) \hat{\eta}_1(x'_n)$$

or

$$r(x) = 2 \hat{\eta}_1(n) \hat{\eta}_2(n)$$

By symmetry of r^* in $\hat{\eta}_1$

$$r(n) = 2 \hat{\eta}_1(n) \hat{\eta}_2(n) = 2 \hat{\eta}_1(n) (1 - \hat{\eta}_1(n))$$

$$= 2r^*(n) (1 - r^*(n))$$

or $r(n) = r^*(n) + (1 - 2r^*(n)) g(r^*(n), n)$