

1.

$$P_{\text{cat}} = \frac{4}{4+6+3} = \frac{4}{13} = .31, \quad R_{\text{cat}} = \frac{4}{4+1+1} = .\overline{6}$$
so $.31$

$$P_{\text{fish}} = \frac{2}{2+1} = .\overline{6}, \quad R_{\text{fish}} = \frac{2}{6+2+2} = .2$$
so $.2$

$$P_{\text{hen}} = \frac{6}{6+2+1} = .\overline{6}, \quad R_{\text{hen}} = \frac{6}{6+3} = .\overline{6}$$
so $.\overline{6}$

$$CBA = \text{Avg}(. \overline{6}, .2, .41) = 1.17$$

2.

$$S_{\text{cat}} = \frac{2+0+2+6}{2+0+2+6+6+3} = .53, \text{ recall was } .\overline{6} \text{ so avg} = .596$$

$$S_{\text{fish}} = \frac{4+3+6+1}{4+3+6+1+1+0} = .9 \overline{3}, \text{ recall was } .2 \text{ so avg} = .5 \overline{6}$$

$$S_{\text{hen}} = \frac{6+3+2+0}{6+3+2+0+2+6} = .58, \text{ recall was } .\overline{6} \text{ so avg} = .623$$

$$BA = \text{avg}(.596, .5 \overline{6}, .623) = .595$$

3.
$$d = \sqrt{(5-1-4.9)^2 + (3.5-3)^2 + (1.4-1.4)^2 + (.2-.2)^2} = \sqrt{.2^2 + .5^2 + 0^2 + 0^2} = \sqrt{.29} = .539$$

4.

$$f_1 = 5.1 + .4(4.9-5.1) = 5.1 - .08 = 5.02$$

$$f_2 = 3.5 + .4(3-3.5) = 3.5 - 0.2 = 3.3$$

$$f_3 = 1.4 + .4(1.4-1.4) = 1.4$$

$$f_4 = .2 + .4(.2-.2) = .2$$

$$\text{sample} = (5.02, 3.3, 1.4, .2)$$

5.

$$\text{centroid} = \left(\frac{5.1+4.9+4.7}{3}, \frac{3.5+3+3.2}{3}, \frac{4.1+4.1+4.1}{3}, \frac{.6+.6+.6}{3} \right) = (4.9, 3.23, 1.37, 0.2)$$