

Recitation 19

1 Bayes' Rule

a. $\frac{\Pr(A \cap B)}{\Pr\{B\}} \Pr\{B\} = \frac{\Pr(A \cap B)}{\Pr\{A\}} \cdot \Pr\{A\}$

b. $\frac{\Pr\{R^{\wedge} U\}}{\Pr\{U\}} = \frac{.8 \times .3}{.4} = .6$

2 DNA Profiles

a. $1 - e^{-\frac{m^2}{2N}} = 1 - e^{-\frac{300m^2}{2 \cdot 2ab}} \approx 1$

b. 2 arbitrary people matching is a certainty.
Not a particular person matching.

3 The Immortals

a. McLeod is right. If P tends to tails.

b. $hP(1-P)^{h-1}$

c. $\max_P \{ hP(1-P)^{h-1} \} \Rightarrow P = \frac{1}{h}$

d. $h \cdot \frac{1}{h} \left(\frac{h-1}{h} \right)^{h-1} = \left(\frac{h-1}{h} \right)^{h-1} = \left(1 - \frac{1}{h} \right)^{h-1} \longrightarrow 1/e$