02-711: Computational Molecular Biology and Genomics
Quiz # 6

February 24, 2009

Name:

You have 15 minutes to complete the quiz. The quiz is closed book. You may use a calculator to do numerical computations. If there are any questions, clarifications, or errors, feel free to talk to the instructor or TA. Please make sure you write your name on the quiz.

1 Linkage Disequilibrium

In a diploid population that mates randomly, you found the allele frequencies of two biallelic sites (A/a) and (B/b) to be $p_A = 0.4$, $p_a = 0.6$, $p_B = 0.75$, and $p_B = 0.25$.

(a) What is the maximum and minimum possible values of disequilibrium coefficient D_{AB}?

(b) Suppose you know the haplotype frequency, $p_{AB} = 0.8$, what is the disequilibrium coefficient D_{AB}?

(c) Compute r^2 (a.k.a. Δ^2).

(d) Suppose the population has undergone 2 generations of random mating and found the disequilibrium coefficient (D_{AB}^2) to be 0.405. What is the recombination rate θ?