

Directions: Clearly, concisely and accurately answer the following exercises, writing **very** neatly; email submissions are not accepted – turn in a hard copy of your solutions. Keep at least 4 decimal places in your calculations.

- A. [All Students] Redo the single-linkage cluster analysis (at the nucleotide level) on pp.273-6 by hand using the full primate dataset given at the top of p.266, and produce (by hand) the dendrogram. Show all needed calculations and show each of the intermediate distance matrices (D_1, D_2, D_3, D_4). Also, clearly indicate the respective clusters for the following distance criteria: *distance* = 0.14, *distance* = 0.12, *distance* = 0.11, *distance* = 0.08, *distance* = 0.05.
- B. [All Students] p. 288, exercise 6. Use R for this exercise. No need to scale the data here since the column SDs are equal.
- C. [Graduate Students only] p. 287, exercise 4.
- D. [Graduate Students only] p. 288, exercise 7.