**Assignment I -** *Read Baum & Smith Chapters 1-4 and answer the following questions.*

This is an independent self-evaluation that is meant to verify that you understand the basics of how phylogenetic trees are interpreted and what they represent.

Chapter 2, Questions 8, 14, 15  
Chapter 3, Questions 1-10, 12, 14-20

Chapter 4, Questions 2, 5, 8, 9, 10, 11, 15,

The answers to the above questions are in the back of the book (end of the PDF). After you have attempted each question, you may check your answers to see if they are correct. If you didn’t get it right, see if you can understand why. If you can’t, bring your question to class.

1. A) Consider your personal family tree (i.e. a pedigree). You have 2 biological parents, 4 grandparents, 8 great grandparents and so on (suggesting the formula 21 parents, 22 grandparents, 23 great grandparents 2X X-fold great grandparents). Thus, your number of ancestors increases as you go back in time. Now consider a phylogeny. Rather than expanding as we go back in time, phylogenetic trees collapse, so that all life has a single ancestor. Both a pedigree and a phylogeny have tree-like branching structures, but they go in opposite directions. What explains this difference?   
  
B) If we use the formula in the question A above we can get our number of ancestors after say, 25 generations (25 generations for humans is ~ 400-900 years). This would give each of us 225 > 33 billion individual ancestors 25 generations ago. Of course, 400-900 years ago the human population on earth was only about 400 million individuals. What explains this apparent conflict? Why is this explanation actually critical for our understanding of what phylogenies represent?

2. Describe the difference in philosophy between phylogenetic systematists and evolutionary systematists.

3. What are phylogenies? Are they a) hypotheses b) real facts that exist in nature or c) a metaphor? This is just something to think about, a full answer may take you too long to write, but put down your best thoughts in 1 short paragraph.