BMTH311: Assignment #3

Required Reading.

- Read §5.3-5.4

To be turned in January 30th, at the start of class.

1. Exercise 5.4.1, page 154.

2. Exercise 5.4.2, page 154.

3. Prove that the reaction scheme in figure 5.18 has no structural conservations.

4. Show that the reaction scheme in Exercise 2.1.1 on page 22 (with mass action kinetics) has a basis of three conservation laws. Also find a basis for the structural conservations in the case where the kinetics are unknown. Discuss the key differences you observe.

5. Compute structural conservations and flux profiles, if they exist, for the model of figure 2.15 on page 49. Assume that reversibility, irreversibilty has been explicitly denoted in the diagram.

6. Obtain steady state flux profiles for the model in figure 5.15 on page 154, assuming that v_3 has been measured. Assume that reversibility, irreversibilty has been explicitly denoted in the diagram.

7. For the model of figure 5.8 on page 145, suppose that the steady state fluxes describing ATP consumption and for conversion of homocysteine to adenosylhomocyctein have been measured and are non-zero. Show that the system describing the unknown steady state fluxes is overdetermined and find the best approximate solution.