CBE2124 – Analysis of Chemical and Biological Processes
Homework No. 3

1. Problem 4.6
2. Problem 4.7
3. Problem 4.23
4. Problem 4.29
5. Problem 4.38. Just draw and label a flowchart based on the textual description. You do not need to solve for the variables asked for in parts (a)-(c).
6. Problem 4.56
7. Problem 4.62
8. Problem 4.69

Problem solutions will be distributed separately.

NOTES on the HW solutions:
In 4.7, butanol instead of hexanol is mentioned, but otherwise things seem OK. Also, in part d) figure of the homework solutions, the figure has C₄H₉OH instead of C₆H₁₅OH.
In 4.23, you are expected to make reasonable approximations in solving this problem. For example, the urea contribution may be neglected in the water mass balance, as it is very small.
In 4.38, if you do attempt a solution (not needed, see above), note that part a) of the solutions, in the mass balances on mixer/filter 2, should list C₂L instead of C₃L. Also, in the figure to part b) of solutions, on the raffinate Q₉ stream it should be labeled as 0.015 kg F/kg, not as 0.15 kg F/kg.
In 4.62, the solutions assume a fresh feed rate of 40000 instead of the 60000 given in the text. However, you can still check your answers by rescaling the flowrates they get.
In 4.69, there is a typo when the n₄ flowrate is calculated, as it is referred to as n₃.

In general, the solutions only loosely follow the idea of performing a degree of freedom analysis; rather, they tend to launch directly into calculations. Regardless, please note that I still expect you to know how to do the DOF analysis (like we did in the class examples).