ChE471
Extra Problems for Lecture 1

1. **Stoichiometry**
   \[ A + 3B = 2P \text{ (gases)} \]
   a) **Batch** \( V = \text{const}, \ T = \text{const} \)
      \[ C_{A_0} = C_{B_0} = 0.1 \text{ (mol/L)}; \ C_p = 0 \]
      Find \( x_B, C_A, C_P \) when \( C_B = 0.01 \text{ (mol/L)} \)
   b) **Batch** \( P = \text{const}, \ T = \text{const} \)
      \[ C_{A_0} = C_{B_0} = 0.1 \text{ (mol/L)}; \ C_p = 0 \]
      Find \( x_B, C_A \) when \( C_B = 0.01 \text{ (mol/L)} \)
   c) **Flow System** \( P = \text{const}, \ T = \text{const} \)
      \[ C_{A_0} = C_{B_0} = C_p = 0.1 \text{ (mol/L)} \]
      Calculate \( C_A, C_B, C_P \) when \( x_B = 0.8 \)

2. **Stoichiometry**
   \[ 2A + B = P \text{ (liquid)} \]
   a) **Batch** \( V = \text{const}, \ T = \text{const} \)
      \[ C_{A_0} = C_{B_0} = C_p = 0.1 \text{ (mol/L)} \]
      Find \( x_A \) when \( C_A = 0.01 \text{ (mol/L)} \) and calculate \( C_B, C_P \).
   b) **Flow System** \( P = \text{const}, \ T = \text{const} \)
      Repeat part (a)

3. **Stoichiometry**
   \[ 2A + B = P \text{ (gases)} \]
   Repeat parts (a) and (b) of problem 2.