CS CM 182 Lab 5

Name : Sum Yi Li
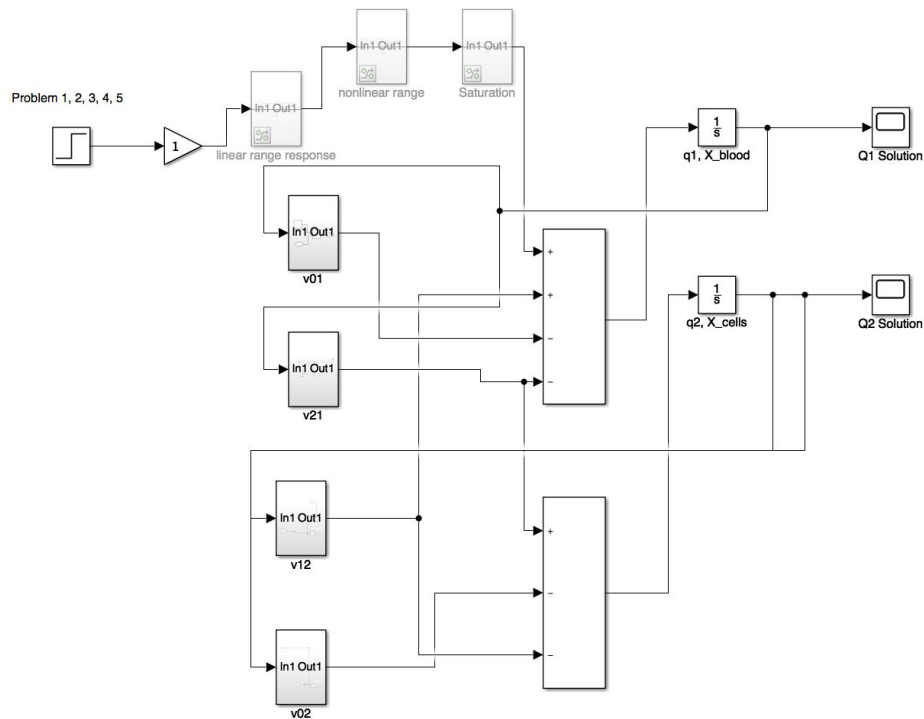Student ID : 505146702

I completed this written part of the homework, lab report, or exam entirely on my own.
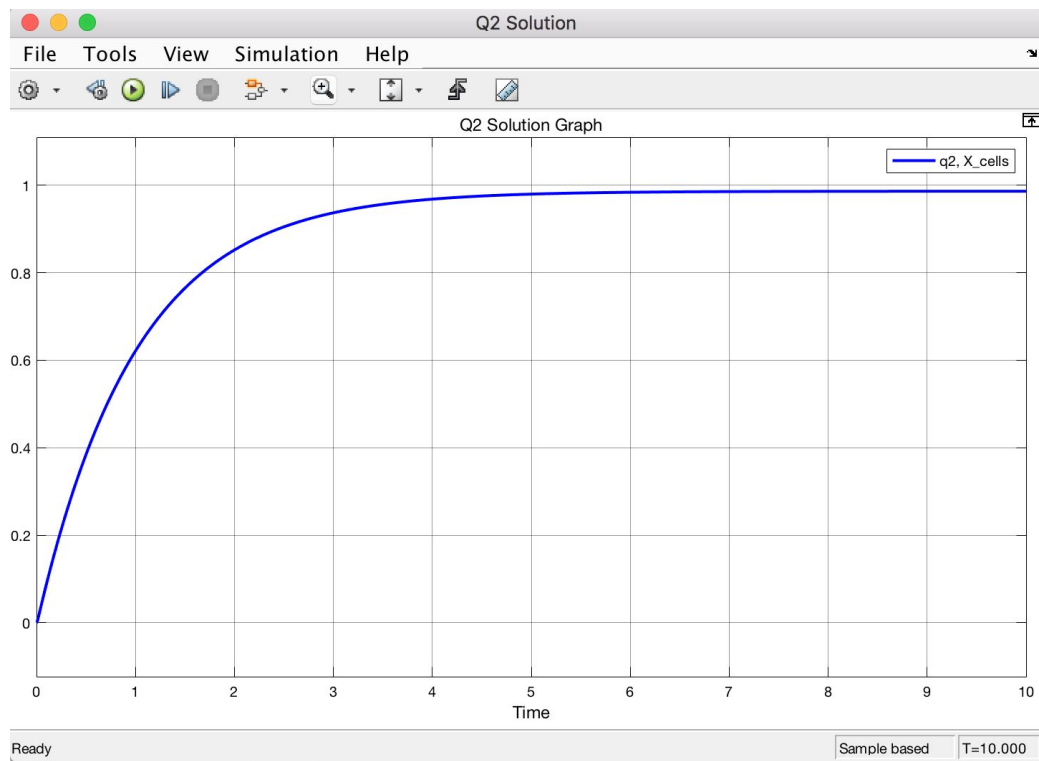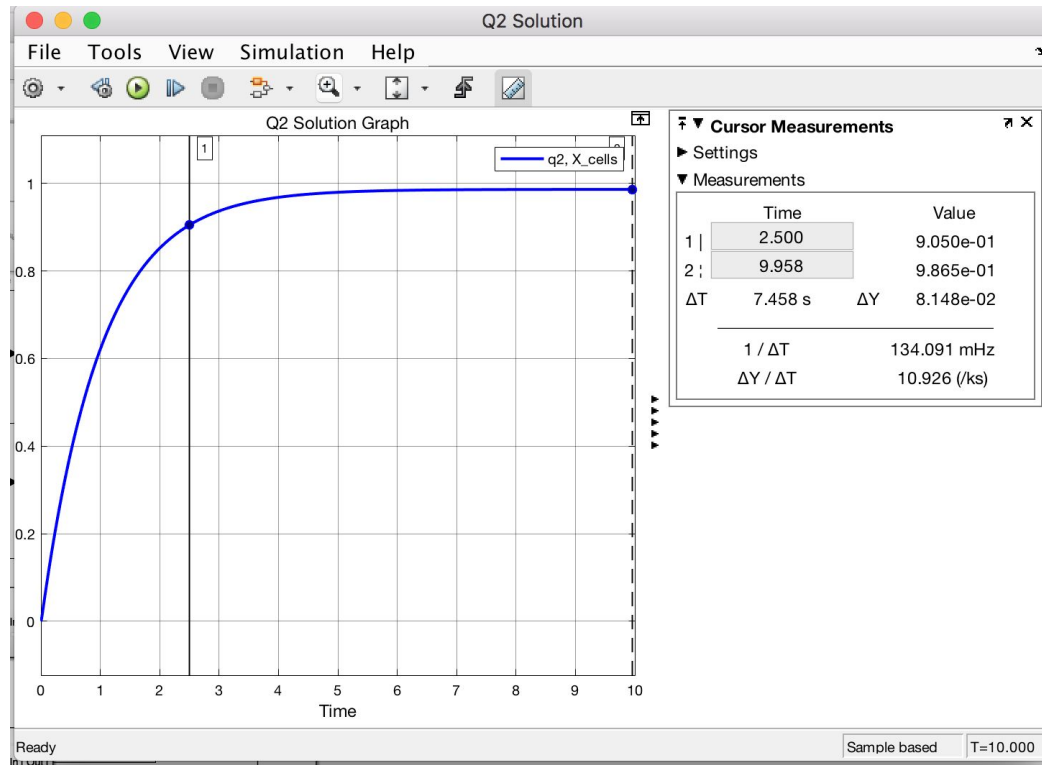
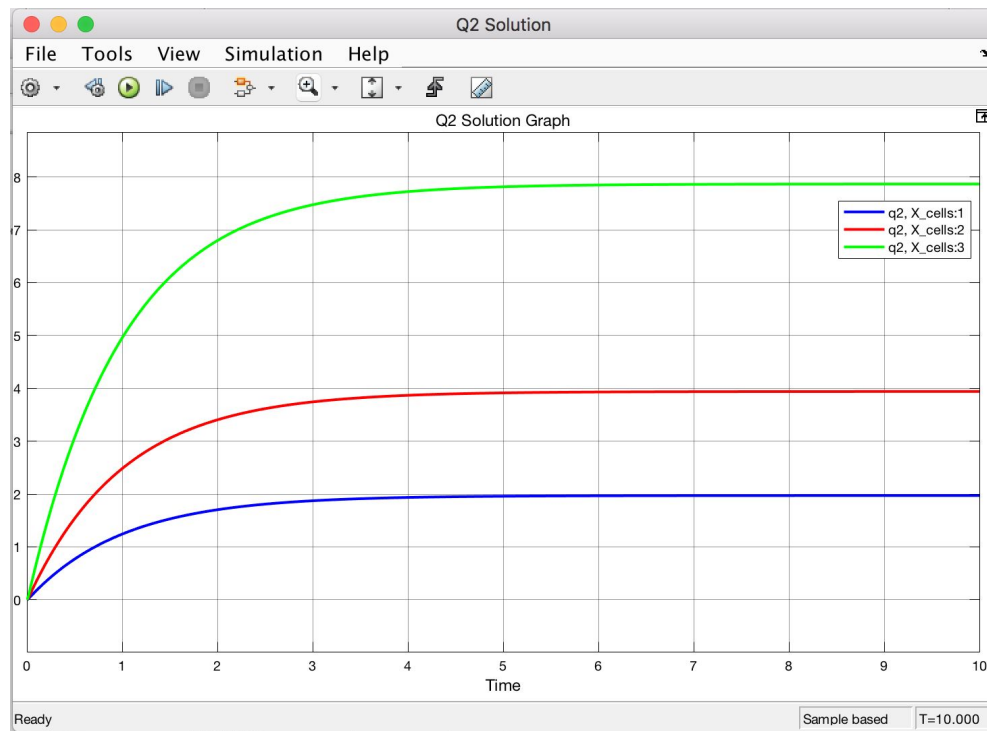# Exercise 1

Simulink

Graph

Analysis

The steady value that Q2 reached is 9.865e-01.
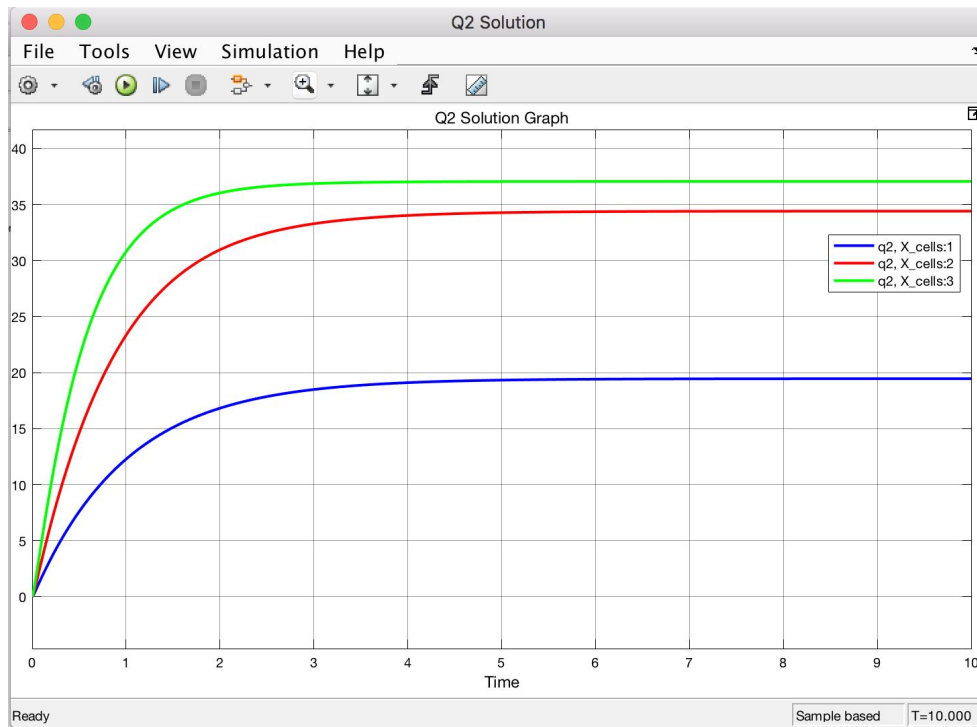
Exercise 2 (Linear range responses)

Analysis

The three values that exhibit a linear range response in the q2 compartment.

D, $[\, d_1 \,,\, 2\, d_1 \,,\, 4\, d_1 \,]$
$d_1 = 2$
[2, 4, 8]

Exercise 3 (Non linear range responses)

Analysis

The three values that exhibit an nonlinear range response in the q2 compartment.

D, $[\, d_1 \,,\, 2\, d_1 \,,\, 4\, d_1 \,]$
$d_1 = 20$
[20, 40, 80]
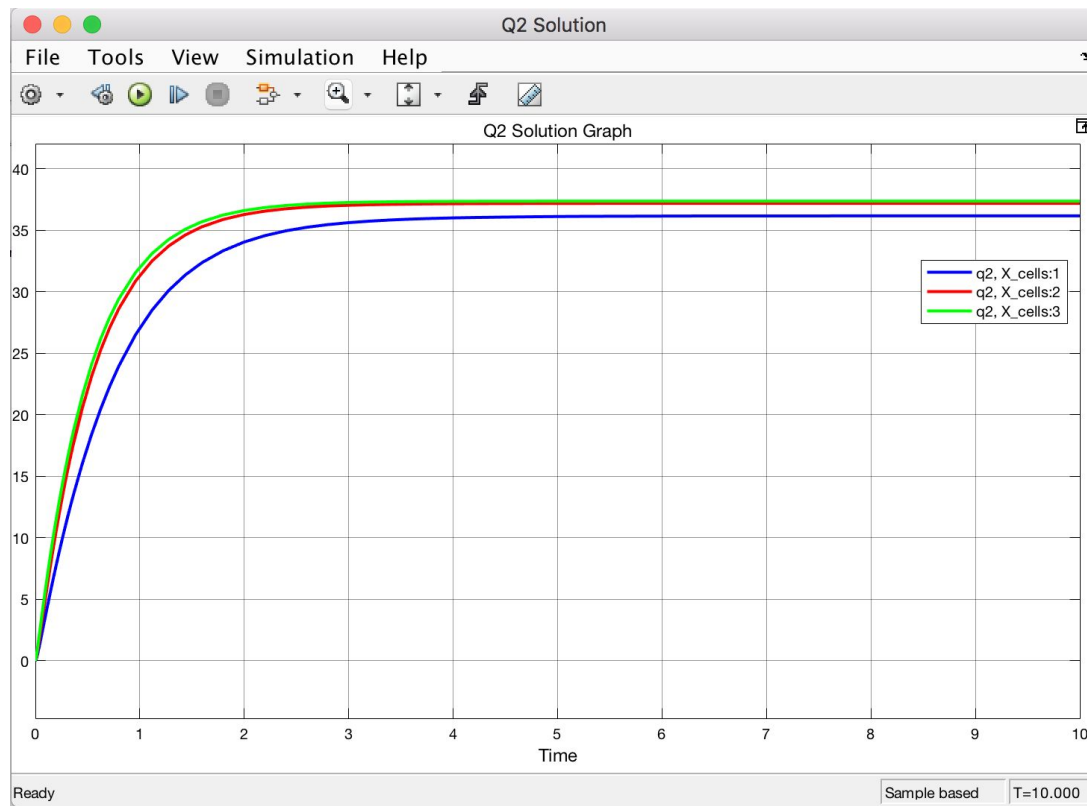
Exercise 4 (Saturation range responses)

Analysis

The three values that exhibit an saturation range response in the q2 compartment.

D, $[d_1, 2d_1, 4d_1]$
$d_1 = 50$
[50, 100, 200]

Exercise 5

Exercise 5

$$V_{21} = \frac{Cq_1}{K + q_1}$$

When $q_1 \ll 1$,

$$V_{21} = \frac{Cq_1}{K + \cancel{q_1}^{0}} = \frac{Cq_1}{K} = \frac{75q_1}{0.5}$$

$\underset{\text{neligible}}{\downarrow}$

$$= \boxed{150 \, q_1}$$

When $q_1 \gg 1$,

$$V_{21} = \frac{Cq_1}{\cancel{K} + q_1} = \frac{C\cancel{q_1}}{\cancel{q_1}} = \boxed{75}$$

$\underset{\text{negligible}}{\downarrow}$