NATIONAL TAIWAN UNIVERSITY,
GRADUATE INSTITUTE OF BIOMEDICAL ENGINEERING AND BIOINFORMATICS

BEBI5009:
Mathematical Modeling of System Biology
Homework 5

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1 5.6.3 Metabolic Control Analysis: supply and demand

Consider the two-step reaction chain $\xrightarrow{v_0} S \xrightarrow{v_1}$, where the reactions are catalysed by enzymes E_0 and E_1 with concentrations e_0 and e_1. The Summation Theorem (Section 5.2.1) states that

$$C^J_{e_0} + C^J_{e_1} = 1$$

A complementary result, the Connectivity Theorem (Heinrich and Schuster, 1996) states that

$$C^J_{e_0}\epsilon^0_S + C^J_{e_1}\epsilon^1_S = 1$$

a) Use these two statements to determine the flux control coefficients of the two reactions as

b) example q2

2 question B

a) example q1

b) example q2