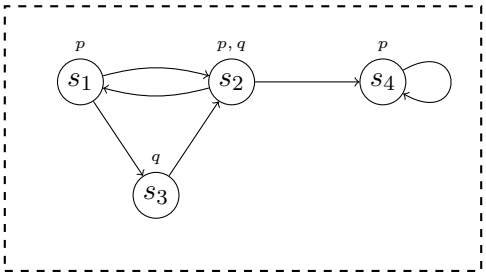
Netzwerkanalyse SS 2015
Alexander Bockmayr
Therese Lorenz

Exercise Sheet 5

May 23, 2015

Exercise 1. *Tutorial*
Given the following state transition graph,



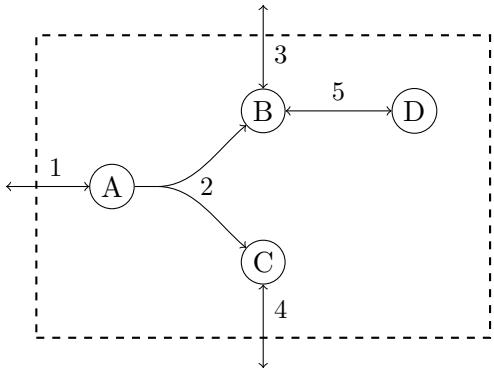
use the labeling algorithm to determine all those states of G in which each of the CTL formulas

1. $AF(E\,[p\,\mathrm{U}\,q] \wedge EXp)$
2. $AF(EG(p \wedge q))$

are true.

Exercise 2. *Tutorial*

a) For the following network write down the



- Metabolites
- Reactions
- Irreversible reactions
- Stoichiometric matrix

Assume that all stoichiometric coefficients belong to $\{-1, 0, 1\}$.

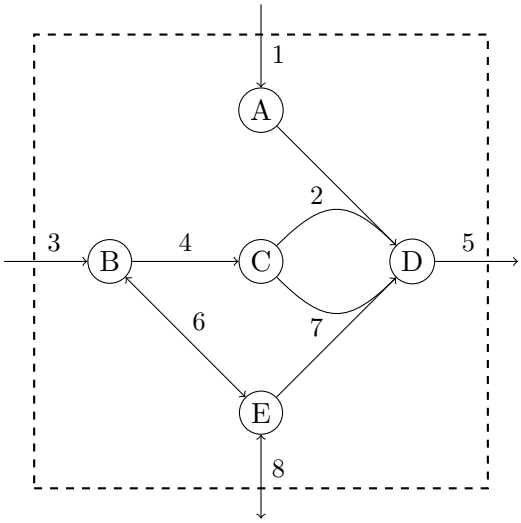
b) What are the thermodynamic irreversibility constraints and the stoichiometric constraints for this metabolic network?

c) Which of the following vectors are possible flux vectors for this network?

$$v = (1, -1, 1, 0, 0)^T \qquad v' = (-1, 1, 1, 0, 0)^T \qquad v'' = (-1, 1, 1, 1, 0)^T$$

Exercise 3. *Homework* 4 P.

Consider the following network. Assume that all stoichiometric coefficients belong to $\{-1, 0, 1\}$.



Determine the following properties:

a) Metabolites

b) Reactions

c) Irreversible reactions

d) Stoichiometric matrix

Write down the steady-state flux cone and find two valid flux vectors.

Send the solution to the third exercise until Friday, 29th, 10:00 a.m. to `Therese.Lorenz@fu-berlin.de`.