EXERCISES S-38.215: WEEK 3

Exercise 8:

A communication channel can transmit 10 messages per time unit. There are two users of the channel behaving, independently of each other, in the following way. A user alternately offers messages at rate 8 during exponentially distributed periods with mean 3 and does not offer messages during exponentially distributed periods also with mean 3. In front of the communication channel a buffer is placed to avoid that messages are lost. Use a fluid model to decide how large the buffer should be such that at most 5 percent of the messages is lost.

Exercise 9:

Similar as exercise 8, but now a user alternately offers messages at rate 10 during exponentially distributed periods with mean 2 and does not offer messages during exponentially distributed periods with mean 3.

This is an example of a fluid model for which the net input rate of the buffer is equal to zero for at least one of the states of the underlying Markov process. Adapt the analysis presented in the lecture of this week to this situation.