Distributed System I
Wintersemester2020/21
Assignment 4

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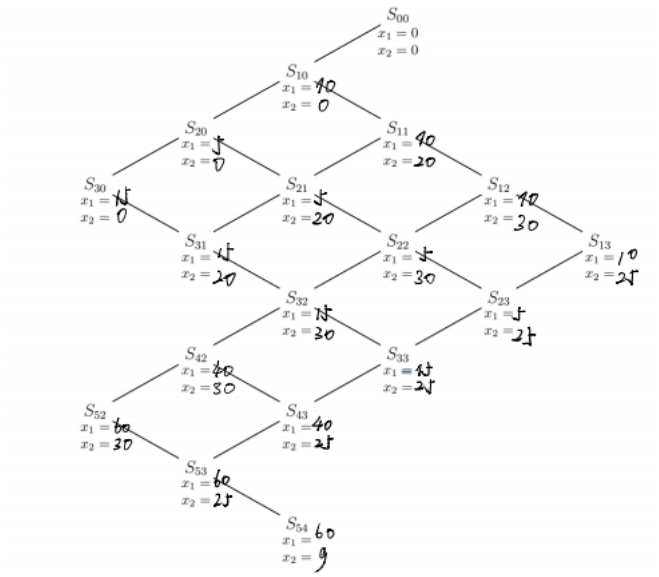
1 Global State

a)

C_1 is a consistent cut. Because there is no message from future.
C_2 is not a consistent cut. Because e_2^4 need message from future (e_1^5)

b)



c)

i. S_{10} and S_{42} is true. So its Possibly.
ii. S_{42},S_{43},S_{52},S_{52} is true. Every Linearization must pass. So it's definitely.

2 Transaction Processing

a)

4 pairs.
1. $r_1[y], w_2[y]$
2. $r_1[u], w_3[u]$
3. $r_2[x], w_3[x]$
4. $w_2[y], r_3[y]$

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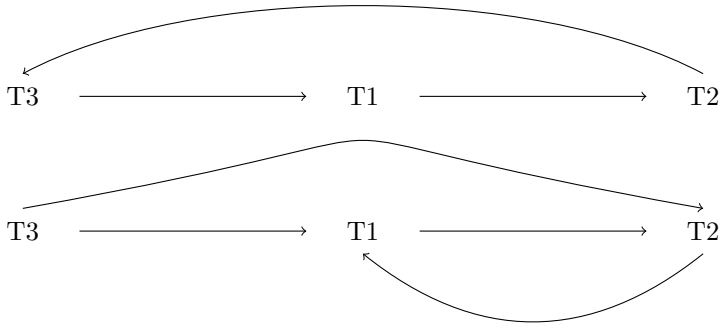
b)



Both Serialization graphs have cycle. So both are not serialisable history.

3 Two-Phase Locking

From the last question. H3 is not serialisable history. So only H1 and H2 can be generated by 2-phase-Locking.
Because: $r_3[w] < w_2[w], r_2[y] < w_3[y]$