

CSC369 Week 10 Notes

Hyungmo Gu

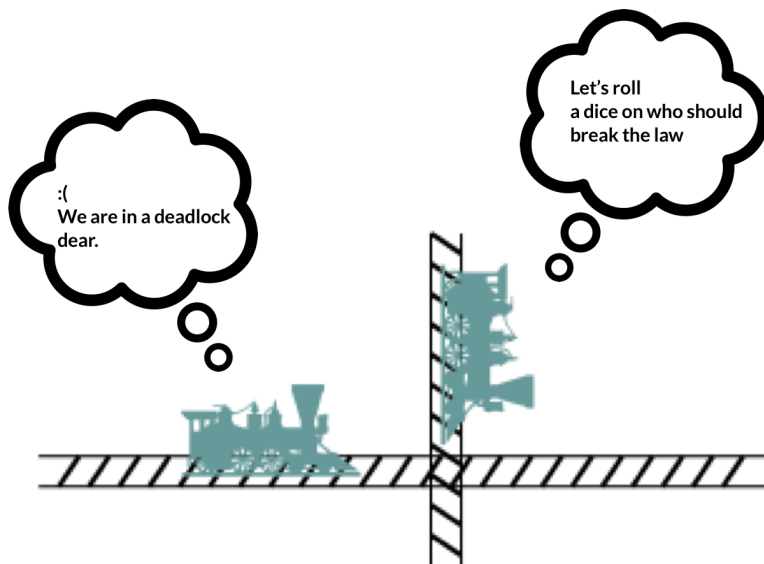
May 31, 2020

- Deadlock Defined

- **Google Definition:** Is a situation one typically involving opposing parties, in which no progress can be made.
- Is permanent
- Happens to set of processes that
 - * Compete for same system resources
 - * Communicate with each other

- Example of Deadlock

- Law passed by Kansas Legislature in in early 20th century
 - * “When two trains approach each other at a crossing, both shall come to a full stop and neither shall start upon again until the other is gone”



- Conditions for Deadlock

- Necessary and Sufficient Conditions
 1. Mutual Exclusion
 2. Hold and wait
 3. No preemption
 4. Circular wait

Aside

1. Wait. Necessary condition? ^[1]
 - We say N is a necessary condition for S if we don't have N , we won't have S .
2. Wait. Sufficient condition? ^[1]
 - We say S is a sufficient condition for N if we have S , then we know that N must follow, i.e. $S \Rightarrow N$
3. Hold on. How about necessary and sufficient condition? ^[2]
 - Is when necessary and sufficient conditions are put together similar to if and only if

References

1) Fayetteville State University: Necessary and Sufficient Conditions, link

- Solutions
- Safe States
- Unsafe States & Algorithm
- What is Atomicity?
- Why would atomicity fail?
- Definitions for Transactions
- How to ensure atomicity in the face of failures?
- Write-ahead logging
- Problems with logging
- Deadlock and Starvation
- Communication Deadlocks
- Livelock