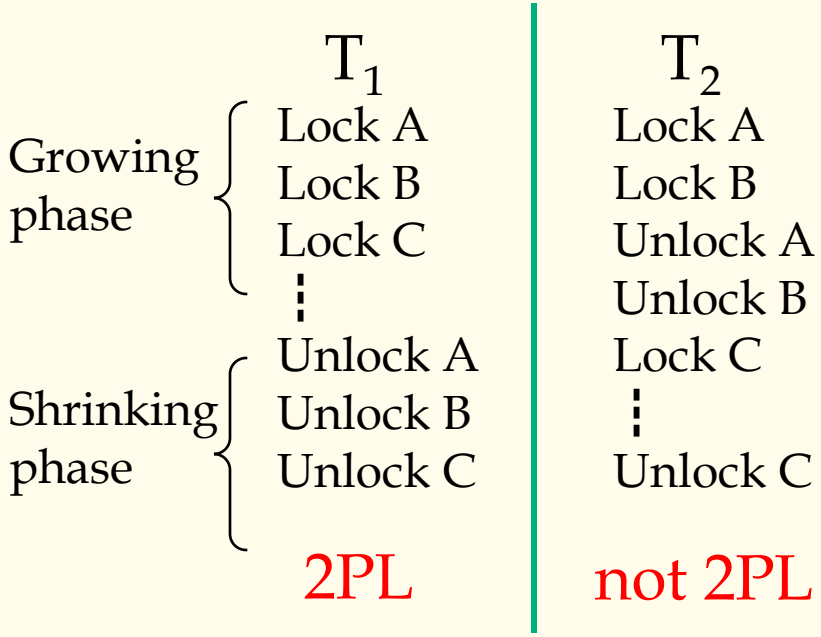
*Two Phase Locking

- *Definiton1:* In a transaction, if all locks precede all unlocks, then the transaction is called two phase transaction. This restriction is called two phase locking protocol.
- *Definition2:* In a transaction, if it first acquires a lock on the object before operating on it, it is called well-formed.

- *Theorem:* If S is any schedule of well-formed and two phase transactions, then S is serializable. (proving is on p151)



Conclusions :

1) Well-formed + 2PL : serializable
2) Well-formed + 2PL + unlock update at EOT: serializable and recoverable. (without domino phenomena)
3) Well-formed + 2PL + holding all locks to EOT: strict two phase locking transaction.

(2) (S,X) locks

S lock --- if read access is intended.

X lock --- if update access is intended.

	NL	S	X
NL	Y	Y	Y
S	Y	Y	N
X	Y	N	N