

Solution 1

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Task 1

(1)

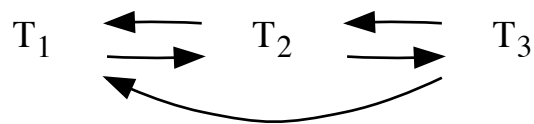


Figure 1: conflict serialization graph

(2)

T1	T2	T3
lock(x) read(x)		
write(x, x+10)	lock(u) read(u)	lock(y) read(y)
		write(y, y+1)
	lock(z) read(z)	
read(z)		
lock(z) wait	unlock(z)	
lock(z)	lock(y) wait	
write(z, z+1)	lock(y)	unlock(y)
	write(y, z+2)	
		lock(v) read(v)
lock(v) wait		write(v, v+y)
		unlock(v)
lock(v)		
write(v, v+z)	read(x)	
unlock(v)	unlock(y)	
	unlock(u)	
unlock(z)		
unlock(x)		

(3)

T1	T2	T3	x
timestamp(t1)			
read(x)			x:t1
write(x, x+10)			
	timestamp(t2)		
	read(u)		u:t2
		timestamp(t3)	
		read(y)	y:t3
		write(y, y+1)	y:t3
	read(z)		z:t2
read(z)			z:t2:t1
write(z, z+1)			z:t2:t1
	write(y, z+2)		y:t3:t2 z:t2:t1:t2
		read(v)	v:t3
		write(v, v+y)	v:t3 y:t3:t2:t3
write(v, v+z)			v:t3:t1 z:t2:t1:t2:t1
	read(x)		x:t1:t2