Assigment 10

1(a)

$S_1 = \langle r_1(x), w_1(y), r_2(y), w_2(x), c_2, w_1(x), c_1 \rangle$
conflict pairs:
$w_1(y) \nrightarrow r_2(y),\ T_1 \to T_2$
$w_2(x) \nrightarrow r_1(x),\ T_2 \to T_1$
$r_1(x) \nrightarrow w_2(x),\ T_1 \to T_2$

$T_1 \to T_2 \to T_1$ circle, then non-conflict serializable

$S_2 = \langle r_1(x), w_1(y), w_1(x), c_1, r_2(y), w_2(x), c_2 \rangle$
conflict pairs:
$w_1(y) \nrightarrow r_2(y),\ T_1 \to T_2$
$w_1(x) \nrightarrow w_2(x),\ T_1 \to T_2$
$r_1(x) \nrightarrow w_2(x),\ T_1 \to T_2$

$T_1 \to T_2$ not a circle, then conflict serializable

$S_3 = \langle r_2(y), r_1(x), w_1(y), w_2(x), c_2, w_1(x), c_1 \rangle$
conflict pairs:
$r_2(y) \nrightarrow w_1(y),\ T_2 \to T_1$
$r_1(x) \nrightarrow w_2(x),\ T_1 \to T_2$
$w_2(x) \nrightarrow w_1(x),\ T_2 \to T_1$

$T_1 \to T_2 \to T_1$ circle, then non-conflict serializable

$S_4 = \langle r_1(x), w_1(y), r_2(y), w_1(x), c_1, w_2(x), c_2 \rangle$
conflict pairs:
$r_1(x) \nrightarrow w_2(x),\ T_1 \to T_2$
$w_1(y) \nrightarrow r_2(y),\ T_1 \to T_2$
$w_1(x) \nrightarrow w_2(x),\ T_1 \to T_2$

$T_1 \to T_2$ not a circle, then conflict serializable

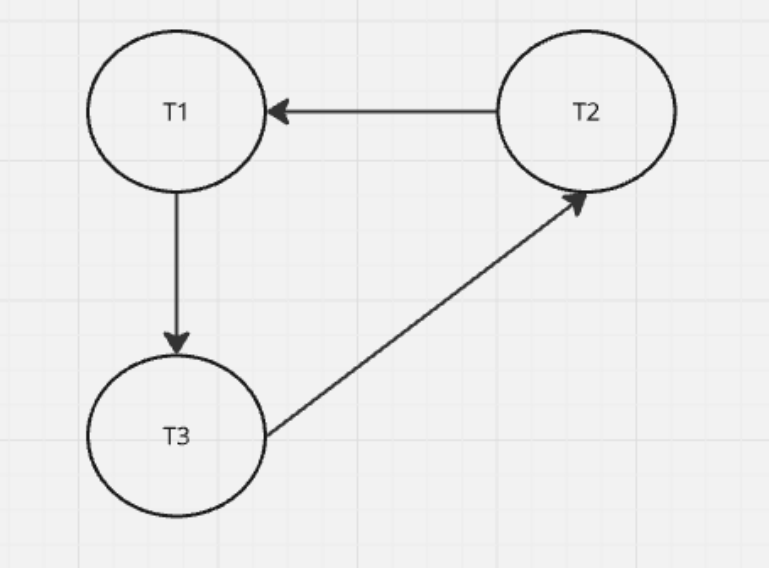
1(b)

$S = \langle r_1(x), w_1(y), r_2(y), w_1(x), w_2(x), c_2, c_1 \rangle$
conflict pairs:
$r_1(x) \nleftrightarrow w_2(x),\ T_1 \to T_2$
$w_1(y) \nleftrightarrow r_2(y),\ T_1 \to T_2$
$w_1(x) \nleftrightarrow w_2(x),\ T_1 \to T_2$

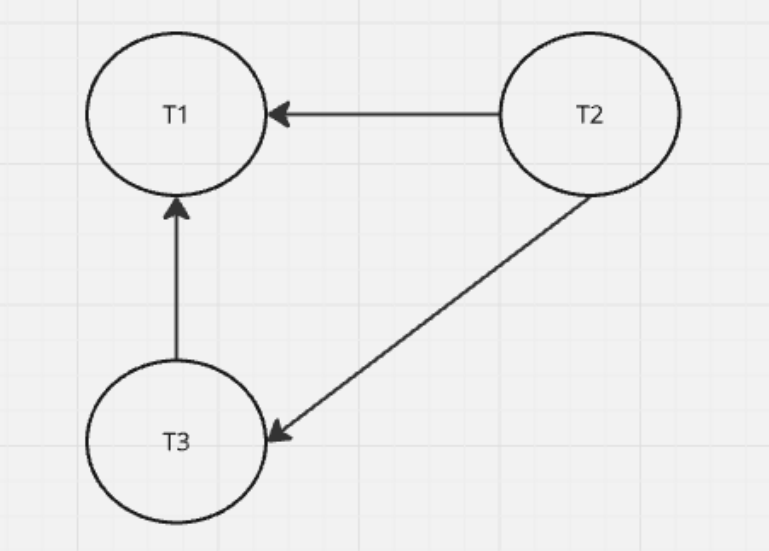
$T_1 \to T_2$ not a circle, then conflict serializable
order of c_2 *and* c_1 is different from the order of T

2(a)

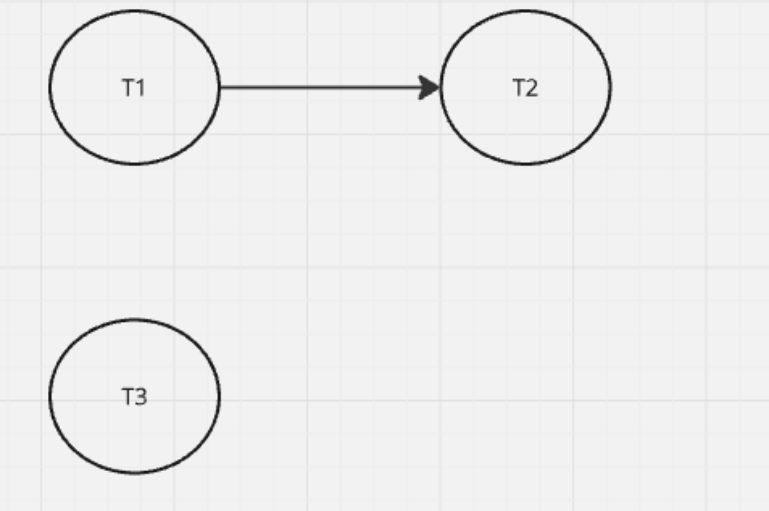
$S_1 = \langle r_3(x), r_1(w), r_2(y), w_2(x), w_1(y), w_3(w), r_1(z), c_1, w_3(z), c_3, r_2(w), c_2 \rangle$
conflict pairs: $(r_3(x)w_2(x)), (r_1(w)w_3(w)), (r_2(y)w_1(y)), (w_3(w)r_2(w)), (r_1(z)w_3(z))$



a circle, then non-conflict serializable
$S_2 = \langle r_2(y), r_3(x), w_3(x), r_1(x), w_2(y), c_2, r_3(y), w_1(y), c_1, r_3(z), c_3 \rangle$
conflict pairs: $(r_2(y)w_1(y)), (w_3(x)r_1(x)), (w_2(y)r_3(y)), (r_3(y)w_1(y)), (w_2(y)w_1(y))$



Serial schedule: $\langle T_2, T_3, T_1 \rangle$
$S_3 = \langle r_1(x), r_3(z), w_3(z), w_1(y), r_2(y), c_1, r_3(z), w_2(x), c_2, c_3 \rangle$
conflict pairs: $(r_1(x)w_2(x)), (w_1(x)r_2(y))$

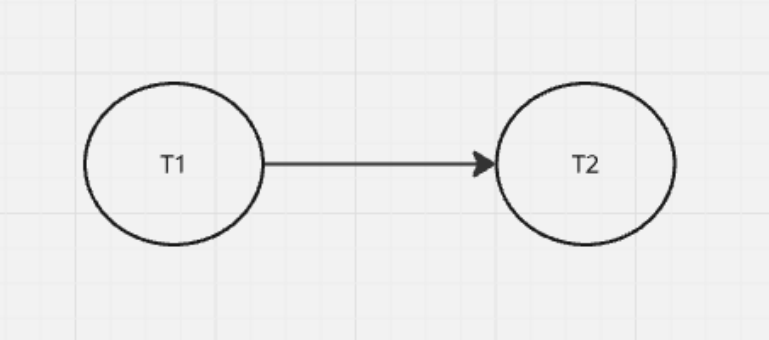


Serial schedules:
$\langle T_1, T_2, T_3 \rangle$, $\langle T_3, T_1, T_2 \rangle$, $\langle T_1, T_3, T_2 \rangle$

2(b)

	Read	Write	Incr
Read		$\nleftrightarrow$	$\nleftrightarrow$
Write	$\nleftrightarrow$	$\nleftrightarrow$	$\nleftrightarrow$
Incr	$\nleftrightarrow$	$\nleftrightarrow$	

$S = \langle r_1(x), w_1(x), in_2(x), in_1(y), r_2(y), c_1, c_2 \rangle$
conflict pairs:
$(r_1(x)in_2(x)), (w_1(x)in_2(x)), (in_1(y), r_2(y))$



Serial schedule : $\langle T_1, T_2 \rangle$