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**Q1:**定义一个三个进程的互斥协议的(公平)卫式迁移模型。说明 模型中所用到的各类符号及其解释。定义安全和必达性质并分析其正确性。

**A1:**

**Assumption:**

1. A,B,C are three different progresses.
2. x=1 means B is requesting to enter critical region or B is already in critical region.

y=1 means C is requesting to enter critical region or C is already in critical region.

z=1 means A is requesting to enter critical region or A is already in critical region.

1. t=0 means that A has a propriety to enter the critical region.

t=1 means that B has a propriety to enter the critical region.

t=2 means that C has a propriety to enter the critical region.

1. VAR: A: {NCR,WAIT,CR}; b: {NCR,WAIT,CR}; x: 0..1; y: 0..1;z:0..1; t: 0..2;

INIT: A=NCR; B=NCR; x=0; y=0;z=0;

T:

A=NCR → (z,t,A):=(1,1,WAIT)V(1,2,WAIT);

A=WAIT∧(（x=0∧y=0）∨ t=0) → (A):=(CR);

A=WAIT ∧¬(（x=0∧y=0）∨ t=0) → (A):=(WAIT);

A=CR → (z,A):=(0, NCR);

B=NCR → (x,t,B):=(1,0, WAIT)V(1,2, WAIT);

B=wait ∧((y=0∧z=0) ∨ t=1) → (B):=(CR);

B=wait ∧¬ ((y=0∧z=0) ∨ t=1) → (B):=(WAIT);

B=CR → (x,B):=(0, NCR);

C=NCR → (y,t,C):=(1,0, WAIT)V(1,1, WAIT);

C=wait ∧((x=0∧z=0) ∨ t=2) → (C):=(CR);

C=wait ∧¬ ((x=0∧z=0) ∨ t=2) → (C):=(WAIT);

C=CR → (y,C):=(0, NCR);

{ ¬(A=NCR), ¬(A= WAIT∧(（x=0∧y=0）∨ t=0)), ¬(A=CR),

¬(B=NCR), ¬(B= wait ∧((y=0∧z=0) ∨ t=1)), ¬(B=CR) ,

¬(C=NCR), ¬(C= wait ∧((x=0∧z=0) ∨ t=2)), ¬(C=CR) }

F:

x=0 ∧ y=0∧z=0 ∧ a=NCR ∧ b=NCR ∧ c=NCR

Θ:

ϕ是模型M的公平必达性质当且仅当∀π∈[[M]].∃k.πk|=I ϕ。

ϕ是模型M的公平安全性质当且仅当∀σ∈rhF(M).σ|=I ϕ。