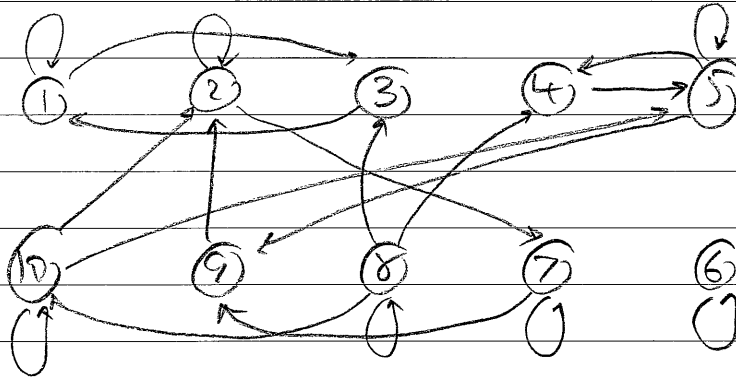


Irreducibility algorithm example, Kao, pp. 172-174
 Also, Game & Thompson, pp. 446-448

$P =$

	1	2	3	4	5	6	7	8	9	10
1	$1/2$		$1/2$							
2		$1/3$					$2/3$			
3	1									
4					1					
5				$1/3$	$1/3$				$1/3$	
6						1				
7							$1/4$		$3/4$	
8			$1/4$	$1/4$				$1/4$		$1/4$
9		1								
10		$1/3$			$1/3$					$1/3$

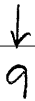


- $T(i) = \{i\}, i = 1, \dots, 10$
- $F(i) = \{\emptyset\}, i = 1, \dots, 10$

All reachable states

$T(1) = 1 \rightarrow 3$

$T(2) = 2 \rightarrow 7$



$T(3) = 3 \rightarrow 1$

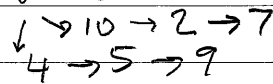
$T(4) = 4 \rightarrow 5 \rightarrow 9 \rightarrow 2 \rightarrow 7$

$T(5) = 5 \rightarrow 4 \rightarrow 9 \rightarrow 2 \rightarrow 7$

$T(6) = 6$

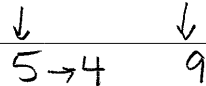
$T(7) = 7 \rightarrow 9 \rightarrow 2$

$T(8) = 8 \rightarrow 3 \rightarrow 1$



$T(9) = 9 \rightarrow 2 \rightarrow 7$

$T(10) = 10 \rightarrow 2 \rightarrow 7$



Where i appear

$$F(1) = 1, 3, 8$$

(1 appears in 1, 3, 8)

$$F(2) = 2, 4, 5, 7, 8, 9, 10 \quad (2 \text{ " " } 2, 4, 5, \dots, 10)$$

$$F(3) = 1, 3, 8$$

$$F(4) = 4, 5, 8, 10$$

$$F(5) = 4, 5, 8, 10$$

$$F(6) = 6$$

$$F(7) = 2, 4, 5, 7, 8, 9, 10$$

$$F(8) = 8$$

$$F(9) = 2, 4, 5, 7, 8, 9, 10$$

$$F(10) = 8, 10$$

• $C(i) = T(i) \cap F(i), \quad i=1, \dots, 10$

✓ $C(1) = 1, 3$

✓ $C(6) = 6$

✓ $C(2) = 2, 7, 9$

✓ $C(7) = 7, 9, 2$

✓ $C(3) = 1, 3$

$C(8) = 8$

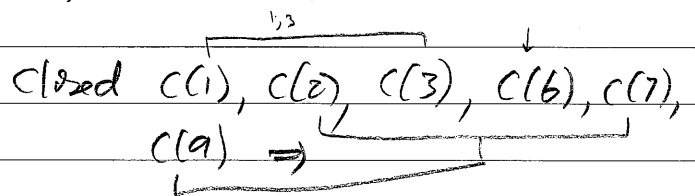
$C(4) = 5, 4$

✓ $C(9) = 2, 7, 9$

$C(5) = 5, 4$

$C(10) = 10$

• If $C(i) = T(i), \Rightarrow C(i)$ closed



$E_1 = \{1, 3\}$

$E_2 = \{2, 7, 9\}$

$E_3 = \{6\}$

Tangent = $\{4, 5, 8, 10\}$