

King Fahd University of Petroleum and Minerals  
 College of Computer Sciences and Engineering  
 Department of Computer Engineering

COE 308 – Computer Architecture (T032)

Quiz # 03

Consider the following reservation table:

		Time							
		0	1	2	3	4	5	6	7
Stages	1	'		'		'			
	2		'					'	
	3				'				'
	4						'		'

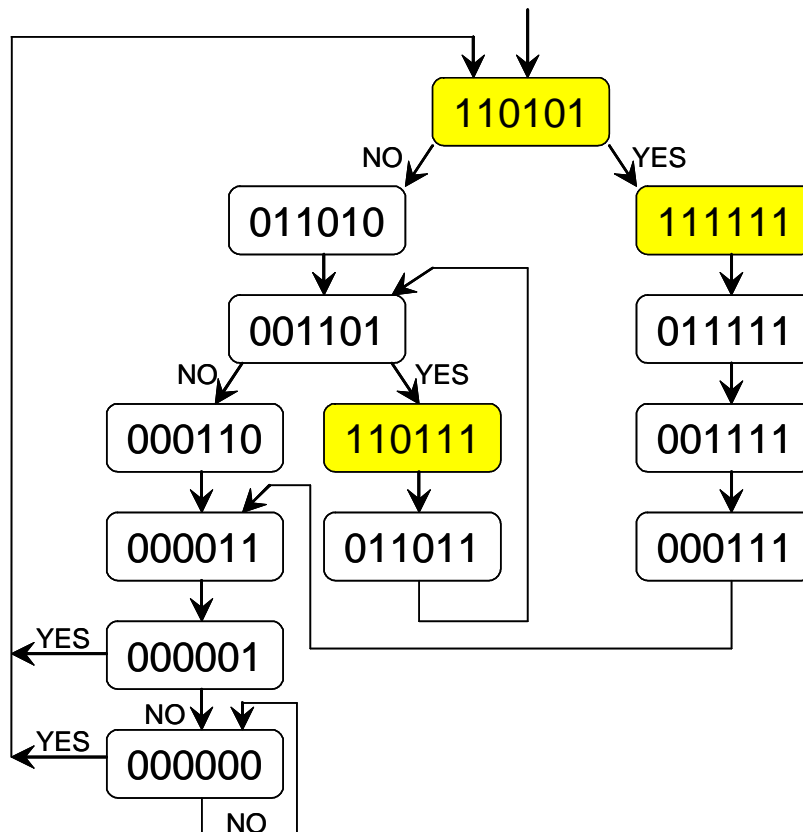
1. Fill out the following table:

Stage	Distances
1	2, 4
2	5
3	4
4	2

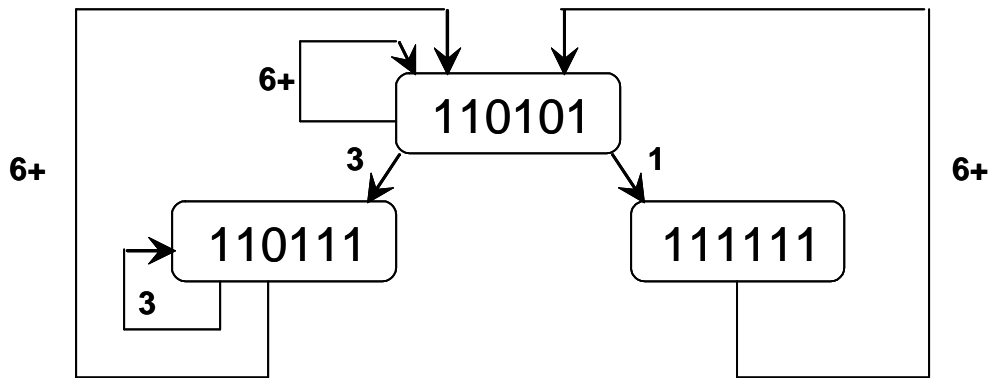
2. Find the *initial collision vector*

$$C_5C_4C_3C_2C_1C_0 = 110101$$

3. Derive the state diagram



4. Simplify the diagram in part (3) into a reduced state diagram



5. List all simple cycles using the following table:

State	Simple Cycle	Average Latency
110101	6,6,6,6, ... or (6)	6
	1,6,1,6, ... or (1,6)	3.5
	3,6,3,6, ... or (3,6)	4.5
111111	6,1,6,1, ... or (1,6)	3.5
110111	3,3,3,3, ... or (3)	3
	6,3,6,3, ... or (3,6)	4.5

6. List all greedy cycles using the following table:

State	Greedy Cycle	Average Latency
110101	(1,6)	3.5
111111	(1,6)	3.5
110111	(3)	3

7. Give all 3 bounds of the minimum average latency (MAL)

Maximum number of Xs in row  $\leq$  MAL  $\leq$  minimum greedy cycle average latency  $\leq$  number of initial collision vector 1s

$\Rightarrow$  3  $\leq$  MAL  $\leq$  3  $\leq$  4