Name: _____

1. For a snooping cache implementation, complete the following matrix for the operations given. The spaces in the spreadsheet between operations are not necessarily an indication of the content that must be provided.

Step	P1			P2			Bus				Memory	
	State	Addr	Value	State	Addr	Value	Action	Proc	Addr	Value	Addr	Value
P1 Read A1												
P2 Read A3												
P1 Write 10 to A2												
P1 Write 20 to A3												

A1 not Equal A2
A1 and A2 share cache block
A3 does not share cache block with either

2. For the same operations in a directory cache scheme, complete the matrix below.. Again the space in the matrix is no indication of the required space.

Matrix for Directory Problem

Step	P1			P2			Bus				Directory			Memory
	State	Addr	Value	State	Addr	Value	Action	Proc	Addr	Value	Addr	State	Procs	Value
P1 Read A1								P1		A1				0
P2 Read A3										A2S1				
								Wm	P2	A2	10				
P1 Write 10 to A2	EX	A / A2												
	EX													
P1 Write 20 to A3	EX Block at ??	A3		N/V	A3		W/M INV	P1 P2	A3 A3		A3 A3	EX INV	A3 P1 P2	

A1 not Equal A2
A1 and A2 share cache block
A3 does not share cache block with either

3. **Why are directory protocols dominant in machines with large numbers of processors?**

scale better
memory traffic is distributed across direct transfer
directory protocols work with distributed memory and an interconnect they can provide
multiple connections and transfers to directorys.