## CS3810 Assignmentlo

Question 1: Let processor is byte-addressable

of Virtual Memory =  $2^{32}$  = 4 GB b) Physical Memory =  $2^{36}$  = 64 GB c) Number of Virtual pages =  $2^{32}/2^{12}$  =  $2^{20}$ d) Number of physical pages =  $2^{36}/2^{12}$  =  $2^{24}$ 

	or) Loru	per of physi	cal horges = 1	112-1			
	Question	2:	S :X   Just 2007	and Republic house	Read Miss	H XLP a	
	Request	Cache Hit/Miss	Request on the bus	who responds	State in cachel	cache 2	Cache3
	Pi:Rdx	miss	RdX	Memory	S	INV	INV
				1/2			
The same of the sa	PI:Wrx	Perms Miss	npgrade. X	No response. other caches invalidate	Mrit Miles	INV	INV
	PziRdx	Read miss	Rdx	Memory	INV	m	INV
2	7 (0)	VMI 1 83	S The pressor	Pead request for	easter has	1219:	9 1 1 1
7	P2:Rdx	Read Miss	Rdx	Pi respondes	INV	Zi S	INV
	12 100/		Sirin	Richard Pressult			
	P3: WrX	write miss	WIX	Pz responds	INV	INV	M
A ALMY						HASTER	N Comment
	Questish Reguest	the Lycke	kehwest	XXO/restograls/	State to	State/i	x 8 thate to
	V/Z/X/	V-N-4/INVis	on/the bus	Later Canada	TYPE SHIP I	Javedry A se	
	1/1/4	her britter of	wither rest	instructions.	the Allega	printe oup	

	Question3:				1/20/198	ru X	
	Request	Cache Hit/Miss	Messages	Dir State	State in Ci	··inC2	inCz
	Pi:Pdx	Miss	Redd Request to Directory	X:5:1	m S	INV	INV
	1111111		Directory responds.	= de = bases	a howled	(0)	
	PI:WrX	Perms Miss	utgrade to request to	X:W:	M	INV	INV
			directory Grants bermission to P	we invieling	a had make	()	
The state of	Pz:Rdx	Read miss	Read request to directory Directory Sprward	X: S:2	INV	3.65	INV
	(A)	1 All state	request to P. P. Sends data to directory.	engersy 9:11		mps)	
	# V[4]		memory write back. Pirectory sends data to	Y ( Y	1300 × 3	9.14	
			12.				
1	P3:WrX	Write Miss	Write request to directory. Pirectory	X:M:3	INV	INV	W
			directory. Pirectory Sends invailed to P2. P2				
	IN	Is val	sends to ACK to Directory Directory grants perms to P3	13 1 1.11	CANST XXS	- 39	
	Ps: Rdx	Read Miss	Read request to directory	X:5:3	INV	to	MOE
		To VALLE	to P2. P2 sends data to	12 hain	10070 01	INN	OS
			directory memory write				
	Visit	The source	back. Pirectory sand data to P3	May Jak	FRIDA XI	0:59	
	1						

Since those footprints were left behind, the attacker was able to essentially walk through the cache and sigure out the elements.

As a result, the processors can defend the melotolour attacker by squashing the illegal instructions in the reorder buffer and clean the foot prints, often.