

ECE4700J Homework 5

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Q1

1. Multimedia extensions typically denote a few operations, while vector specifies dozens of operations.
2. Multimedia extensions stores number of elements in the opcode, which can grow very large as the vector length grows, while vector processor stores it in a separate vector register.
3. Memory access in multimedia extensions should be contiguous, while vector processor allows strided accesses that gather scattered memory data together in a vector register.

Q2

1. 4 cycles; 2 slots

Core 1	Core 2
A_3	B_1, B_4
A_1, A_4	B_1, B_4
A_1, A_2	B_2
A_1	B_3

2. 4 cycles; 2 slots

CPU 1		CPU 2	
Core 1	Core 2	Core 1	Core 2
A_3		B_1, B_4	
A_1, A_4		B_1, B_4	
A_1, A_2		B_2	
A_1		B_3	

3. 9 cycles; 4 slots

FU 1	FU 2
A_1	A_2
B_1	B_4
A_1	
B_1	B_4
A_1	
B_2	
A_3	
B_3	
A_4	

4. 6 cycles; 0 slots

FU 1	FU 2
A_1	B_1
A_1	B_1
A_1	B_2
A_2	B_3
A_3	B_4
A_4	B_4

Q3

No.	Operation	MSI	
		P1	P2
1	P1 reads B	S	I
2	P1 writes B	M	I
3	P2 writes B	I	M
4	P1 reads B	S	S
5	P1 writes B	M	I
6	P2 reads B	S	S
7	P2 writes B	I	M