Name: Kendrick Kee
UOW ID: 7366814

Part 1:
Question 1:

1. Lower case letter (a-z) -> 26 possibilities
2. Upper case letter (A-Z) -> 26 possibilities
3. A valid digit (0-9) -> 10 possibilities
4. A valid digit (0-9) -> 10 possibilities
5. Compulsory "@" -> 1 possibility
6. Upper/Lower case letter (a-z + A-Z) -> 52 possibilities
7. Upper/Lower case letter (a-z + A-Z) -> 52 possibilities
8. A symbol from set {$,9,5,v,w,J} -> 6 possibilities
9. A symbol from set {$,9,5,v,w,J} -> 6 possibilities
10. A symbol from set {$,9,5,v,w,J} -> 6 possibilities

Chosen password: aZ96@Bc9

Entropy = $L \log_2 N$

$L = 1$

$N = 26^2 \times 10^2 \times 1 \times 52^2 \times 6^2$

Entropy = $1_{log}(26^2 \times 10^2 \times 1 \times 52^2 \times 6^2) = 1_{log}(39482726400) \approx$ 35.2bits

As Tiger hash is deterministic and will not additionally entropy to the current associated password pattern.

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Question 2:

1)

	O_1	O_2	O_3	O_4	O_5	O_6
S_1	R	R	R	R	R	RW
S_2	R			W	W	W
S_3	R	RW	RW		W	W
S_4	R			R		W
S_5	R					
S_6	R	R	R		R	

All subjects have Read access / dominance to O_1, hence it has to be the at the lowest level

O_1

2)

	O_1	O_2	O_3	O_4	O_5	O_6
S_1	R	R	R	R	R	RW
S_2	R			W	W	W
S_3	R	RW	RW		W	W
S_4	R			R		W
S_5	R					
S_6	R	R	R		R	

S_3, O_2, O_3

S_3 is able to read & write to O_2 and O_3 exclusively, hence they should be on the same level & above the lowest O_1

O_1

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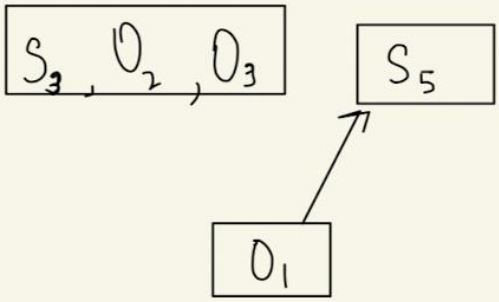
Question 2 (cont):

3)

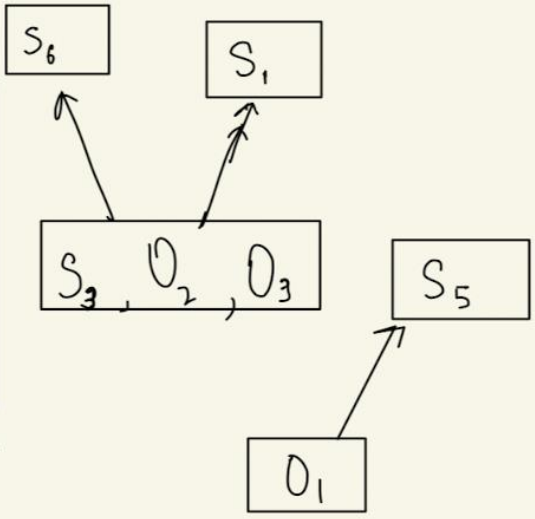
	O_1	O_2	O_3	O_4	O_5	O_6
S_1	R	R	R	R	R	RW
S_2	R			W	W	W
S_3	R	RW	RW		W	W
S_4	R			R		W
S_5	R					
S_6	R	R	R		R	



S_5 is only able to read O_1 exclusively, hence S_5 will dominate O_1

4)

	O_1	O_2	O_3	O_4	O_5	O_6
S_1	R	R	R	R	R	RW
S_2	R			W	W	W
S_3	R	RW	RW		W	W
S_4	R			R		W
S_5	R					
S_6	R	R	R		R	



S_1 & S_6 must be able to dominate O_2, O_3 to allow for reading

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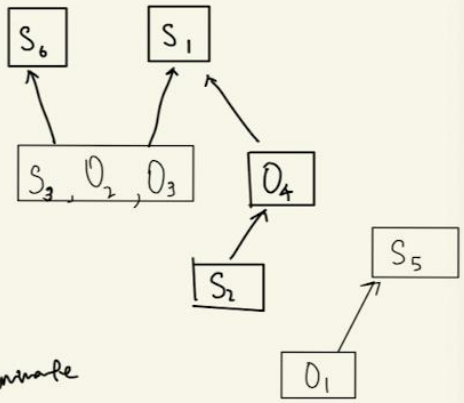
Question 2 (cont):

5)

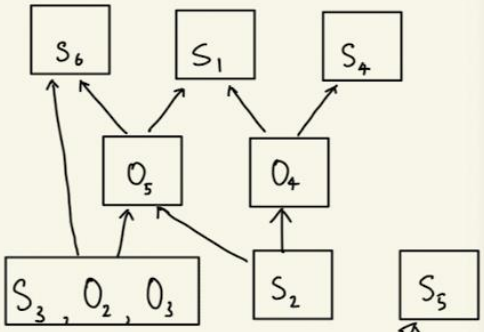
	O_1	O_2	O_3	O_4	O_5	O_6
S_1	R	R	R	R	R	RW
S_2	R			W	W	W
S_3	R	RW	RW		W	W
S_4	R			R		W
S_5	R					
S_6	R	R	R		R	



S_1 and S_4 must be able to dominate O_4 to allow for reading.
Since S_2 only has write access, O_4 will dominate S^2

6)

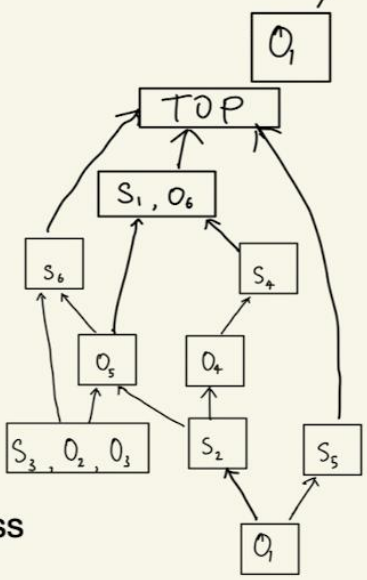
	O_1	O_2	O_3	O_4	O_5	O_6
S_1	R	R	R	R	R	RW
S_2	R			W	W	W
S_3	R	RW	RW		W	W
S_4	R			R		W
S_5	R					
S_6	R	R	R		R	



S_1 must be able to dominate O_5 to allow for reading.
O_5 will dominate both S_3 and S_2 as they only have write access

7)

	O_1	O_2	O_3	O_4	O_5	O_6
S_1	R	R	R	R	R	RW
S_2	R			W	W	W
S_3	R	RW	RW		W	W
S_4	R			R		W
S_5	R					
S_6	R	R	R		R	



O6 but dominate S4 as it only has write access
Completed the lattice with "TOP" level

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Question 3:

Statement	Subject	Objects	Actions
Alice can climb trees and eat apples.	Alice	Trees, Apples	Climb, Eat
Bob can climb fences, eat apples, and wave flags.	Bob	Fences, Apples, Flags	Climb, Eat, Wave
Trees can hurt apples.	Trees	Apples	Hurt
Carol can jumps waves and wave flags.	Carol	Waves, Flags	Jump, Wave

Action set: Climb, Eat, Wave, Hurt, Jump
Rows: Subject
Column: Objects

	Apples	Trees	Fences	Waves	Flags
Alice	Eat	Climb			
Bob	Eat		Climb		Wave
Trees	Hurt				
Carol				Jump	Wave