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CS 4365 HW 2 Part 1

1a. A:  $A > F$ ,  $B > A$ ,  $A = \{ \}$  (3 constraints)

B:  $B > A$ ,  $B > D$  (2 constraints)

C:  $A = \{ \}$  (1 constraint)

D:  $F = D$ ,  $B > D$  (2 constraints).

E:  $F > E$  (1 constraint)

F:  $A > F$ ,  $F > E$ ,  $F > D$  (3 constraints)

A and F have most constraints, so choose A for being first alphabetically.

$A = 1 \rightarrow B = 2 \rightarrow B > A \rightarrow 2 > 1$

$| \leftarrow S C ( = 1 \rightarrow A = \{ \} ) \rightarrow 1 = 1$

$S C ( = 1 \rightarrow A = \{ \} ) \rightarrow 1 = 1 \rightarrow B > D \rightarrow 2 > 1$

$S C ( = 1 \rightarrow A = \{ \} ) \rightarrow 1 = 1$

$E = 1 \rightarrow F > E \rightarrow F > 1$

$E = 1 \rightarrow F > E \rightarrow F > 1$

$F = 1 \rightarrow F > E \rightarrow F > 1$

$F = 2 \rightarrow A > F \rightarrow 1 > 2$

$$F=3 \rightarrow A>F \rightarrow 1 \neq 3$$

$$F=4 \rightarrow A>F \rightarrow 1 \neq 4$$

$$F=5 \rightarrow A>F \rightarrow 1 \neq 5$$

$$F=6 \rightarrow A>F \rightarrow 1 \neq 6$$

$$(=2 \rightarrow A=C \rightarrow 1 \neq 2)$$

$$(=3 \rightarrow A=C \rightarrow 1 \neq 3)$$

$$(=4 \rightarrow A=C \rightarrow 1 \neq 4)$$

$$(=5 \rightarrow A=C \rightarrow 1 \neq 5)$$

$$(=6 \rightarrow A=C \rightarrow 1 \neq 6)$$

$$(=1 \rightarrow A=C \rightarrow 1 \neq 1 = A)$$

$$= 1 \wedge P = 1 \rightarrow B > D \rightarrow 2 > 1$$

$$= 1 \wedge E = 2 \rightarrow F > E \rightarrow F > 2$$

$$F=1 \rightarrow F>E \rightarrow 1 \neq 2$$

$$E=3 \rightarrow F=1 \rightarrow 1 \neq 3$$

$$E=4 \rightarrow F=1 \rightarrow F>E \rightarrow 1\not>$$

$$E=5 \rightarrow F=1 \rightarrow F>E \rightarrow 1\not>$$

$$E=6 \rightarrow F=1 \rightarrow F>E \rightarrow 1\not>$$

$$B=3 \rightarrow B>A \rightarrow 3>1$$

$$(=1 \rightarrow A = (-) (=1 =))$$

$$D=1 \rightarrow B>D \rightarrow 3>1$$

$$E=1 \rightarrow F>1$$

$$F=1 \rightarrow F>E \rightarrow 1\not>1$$

$$B=4 \rightarrow B>A \rightarrow 4>1$$

$$(-=1 \rightarrow A = (-) (=1 =))$$

$$D=1 \rightarrow B>D \rightarrow 4>1$$

$$E=1 \rightarrow F>1$$

$$F=1 \rightarrow F>E \rightarrow 1\not>1$$

$$B=5 \rightarrow B>A \rightarrow 5>1$$

$$C=1 \rightarrow A=C - 7 = 1$$

$$D=1 \rightarrow B>D \rightarrow 5 > 1$$

$$E=1 \rightarrow F=1 \rightarrow F>E \rightarrow 1 \not> 1$$

$$B=6 \rightarrow B>A \rightarrow 6 > 1$$

$$C=1 \rightarrow A=C - 7 = 1$$

$$D=1 \rightarrow B>D \rightarrow 6 > 1$$

$$(=1=) \leftarrow A \leftarrow 1 =)$$

$$E=1 \rightarrow F=1 \rightarrow F>E \rightarrow 1 \not> 1$$

1.  $A=1, B=2, C=1, D=1, E=1, F=1$  failure

2.  $A=1, B=2, C=1, D=1, E=1, F=2$  failure

3.  $A=1, B=2, C=1, D=1, E=1, F=3$  failure

4.  $A=1, B=2, C=1, D=1, E=1, F=4$  failure

5.  $A=1, B=2, C=1, D=1, E=1, F=5$  failure

6.  $A=1, B=2, C=1, D=1, E=1, F=6$  failure

7.  $A=1, B=2, C=2$  failure

8.  $A=1, B=2, C=3$  failure

9.  $A=1, B=2, C=4$  failure

10.  $A=1, B=2, C=5$  failure

11.  $A=1, B=2, C=6$  failure

12.  $A=1, B=2, C=1, D=1, E=2, F=1$  failure

13.  $A=1, B=2, C=1, D=1, E=3, F=1$  failure

14.  $A=1, B=2, C=1, D=1, E=4, F=1$  failure

15.  $A=1, B=2, C=1, D=1, E=5, F=1$  failure

16.  $A=1, B=2, C=1, D=1, E=6, F=1$  failure

17.  $A=1, B=3, C=1, D=1, E=1, F=1$  failure

18.  $A=1, B=4, C=1, D=1, E=1, F=1$  failure

19.  $A=1, B=5, C=1, D=1, E=1, F=1$  failure

20.  $A=1, B=6, C=1, D=1, E=1, F=1$  failure

1b. Choose A again because A comes before F

$$A=1 \rightarrow F=1 \rightarrow A > F \rightarrow 1 \neq 1$$

$$A=2 \rightarrow F=1 \rightarrow A > F \rightarrow 2 > 1 \rightarrow F=1 \rightarrow F > E \rightarrow 1 \neq E$$

$$A=3 \rightarrow A=C=3 \rightarrow A > F=2 \rightarrow F > E = 1 \rightarrow A < B=4 \rightarrow$$

$$A=3, C=3, F=2, D=2, E=1, B=4$$

$$1 \quad A=1 \quad \text{failure} \quad ? = 1 \quad S=8 \quad J=A \quad P$$

$$2 \quad A=2, F=1 \quad \text{failure} \quad ? = 2 \quad S=8 \quad J=A \quad P$$

$$3 \quad A=3, C=3, F=2, D=2, E=1, B=4 \quad \text{solutions}$$

$$1 \quad E < F \rightarrow D < A \rightarrow C < B \rightarrow J = 1 \quad S=8 \quad J=A \quad P$$

A	B	C	D	E	F	J = 1	S = 8	J = A	P
3	4	3	2	1	3				
4	5	4	3	2	3				
5	6	5	4	3	4				

$$A = \{3, 4, 5\}$$

$$B: [4, 5, 6]$$

$$C: [3, 4, 5]$$

$$D: [2, 3, 4]$$

$$E: [1, 2, 3]$$

$$F: [2, 3, 4]$$