

CS 436S HW 2 Part 1

1a. A: $A > F, B > A, A = C$ (3 constraints)

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

C: $A = C$ (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.

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

$C=1 \rightarrow A=C \rightarrow 1=1$

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

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

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

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

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

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

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

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

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

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

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

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

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

$$C=1 \rightarrow A=C \rightarrow 1 = 1$$

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

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

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

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

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

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

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

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

$$C=1 \rightarrow A=C \rightarrow 1=1$$

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

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

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

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

$$C=1 \rightarrow A=C \rightarrow 1=1$$

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

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

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

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

$$C=1 \rightarrow A=1 \rightarrow 1=1$$

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

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

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

$$C=1 \rightarrow A=1 \rightarrow 1=1$$

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

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

$$1. A=1, B=2, C=1, D=1, E=1, F=1 \text{ failure}$$

$$2. A=1, B=2, C=1, D=1, E=1, F=2 \text{ failure}$$

$$3. A=1, B=2, C=1, D=1, E=1, F=3 \text{ failure}$$

$$4. A=1, B=2, C=1, D=1, E=1, F=4 \text{ failure}$$

$$5. A=1, B=2, C=1, D=1, E=1, F=5 \text{ failure}$$

$$6. A=1, B=2, C=1, D=1, E=1, F=6 \text{ failure}$$

$$7. A=1, B=2, C=2 \text{ failure}$$

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

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

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

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

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

$$1 \quad A=1 \quad \text{failure}$$

$$2 \quad A=2, F=1 \quad \text{failure}$$

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

$$1 \quad E < F = D < A = C < B$$

A	B	C	D	E	F
3	4	3	2	1	3
4	5	4	3	2	3
5	6	5	4	3	4

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

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

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

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

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

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