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1. A.)

Constraints:

Constraint 1: domain(HS) = {(0,1)}

Constraint 2: WD(a,b) is close to DS(c,d)

Where:

- a,b,c,d belongs to 0,1,2
- (c,d) != (0,1)
- (a,b) != (0,1)
- (a,b) != (c,d)

If c and d are both odd:

domain(WD(a,b)) = {(c,0),(c,2),(0,d),(2,d)}

If c is even and d is odd:

domain(WD(a,b)) = {(c,0),(c,2),(1,d)}

If c is odd and d is even:

domain(WD(a,b)) = {(c,1),(2,d),(0,d)}

If c and d are both even:

domain(WD(a,b)) = {(c,1),(1,d)}

Constraint 3: BQ(a,b) is not close to WD(c,d)

Where:

- a,b,c,d belongs to 0,1,2
- (c,d) != (0,1)
- (a,b) != (0,1)
- (a,b) != (c,d)

If c and d are both odd:

domain(BQ(a,b)) = {(c,0),(c,2),(0,d),(2,d)}

If c is even and d is odd:

domain(BQ(a,b)) = {(c,0),(c,2),(1,d)}

If c is odd and d is even:

domain(BQ(a,b)) = {(c,1),(2,d),(0,d)}

If c and d are both even:

domain(BQ(a,b)) = {(c,1),(1,d)}

Constraint 4: JSI(a,b) is close to HS(0,1)

Where:

- a,b belongs to 0,1,2
- (a,b) != (0,1)

domain(JSI(a,b)) = {(0,0), (0,2),(1,1)}

Constraint 5: BQ(a,b) is close to DS(c,d)

Where:

- a,b,c,d belongs to 0,1,2
- (c,d) != (0,1)
- (a,b) != (0,1)
- (a,b) != (c,d)

If c and d are both odd:

domain(BQ(a,b)) = {(c,0),(c,2),(0,d),(2,d)}

If c is even and d is odd:

domain(BQ(a,b)) = {(c,0),(c,2),(1,d)}

If c is odd and d is even:

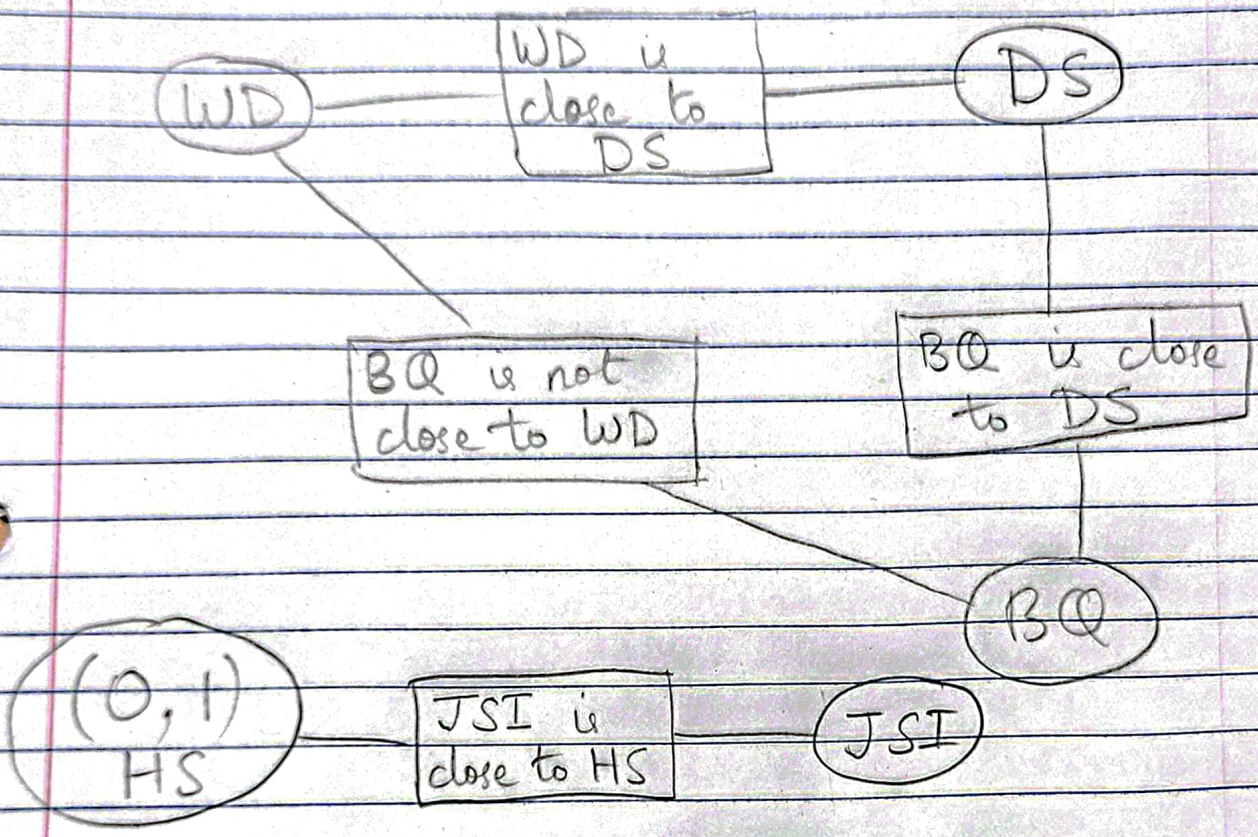
domain(BQ(a,b)) = {(c,1),(2,d),(0,d)}

If c and d are both even:

domain(BQ(a,b)) = {(c,1),(1,d)}

1. B.) **Shown on the next page**

Let WD = McDonald's,
DS = Department Store,
BQ = Burger Queen,
JSI = Japanese Style Inn,
HS = Hot Spring } ≠ (0, 1)
= (0, 1)



WD ≠ DS ≠ BQ ≠ JSI ≠ HS

2. A.)

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

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

C = 6 Failure
B = 6 Failure

solution 1 = 2 1 3 2 1 3
solution 2 = 2 3 1 6 1 3
solution 3 = 4 3 1 6 1 3

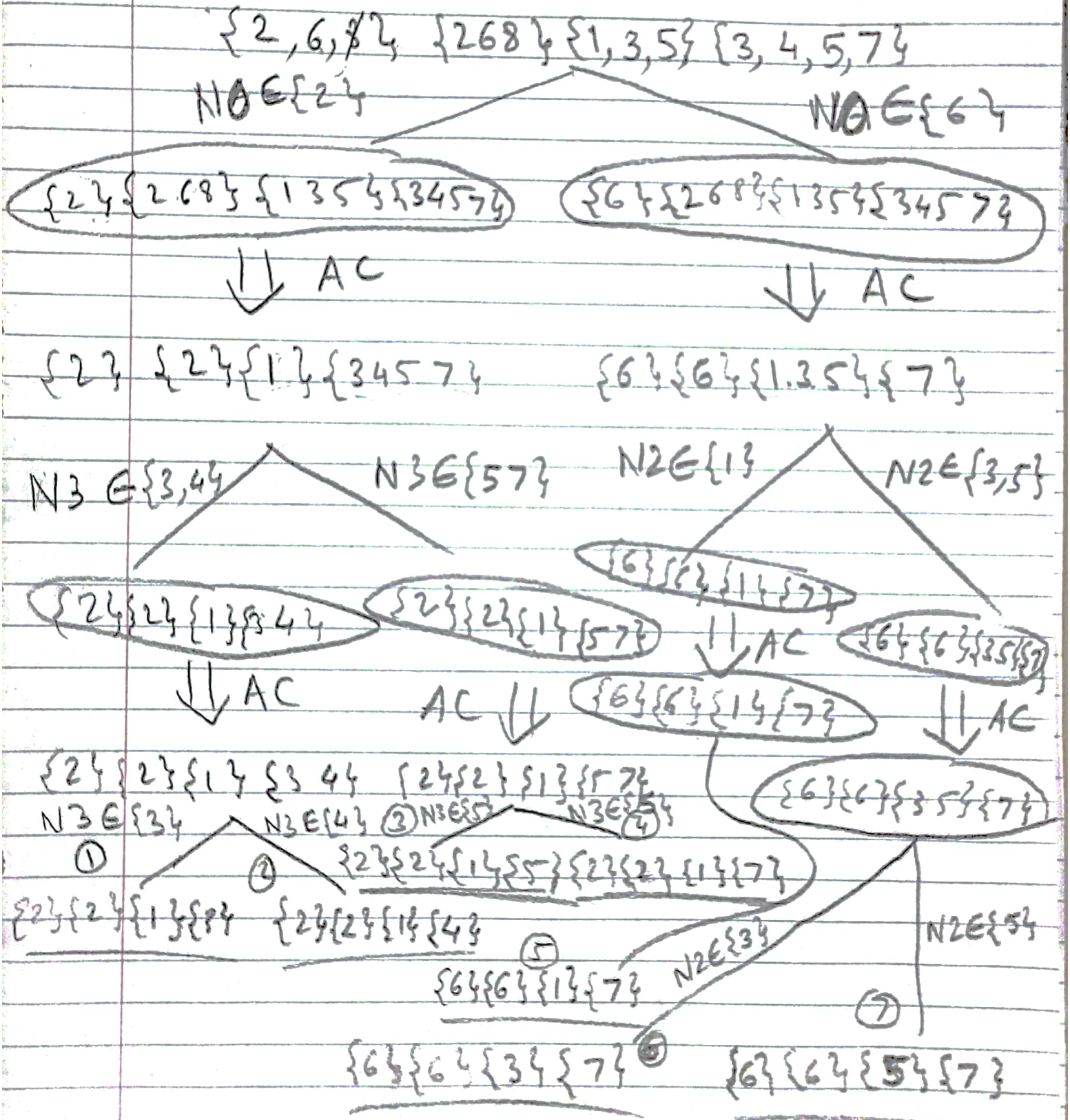
Number of failures: 89
Number of successes: 3

3. A.)

Queue	Arc removed for checking.	Domain of N0	Domain of N1	Domain of N2	Domain of N3	Add arc that needs to be rechecked
⟨N0, (N0=N1)⟩ ⟨N1, (N0=N1)⟩ ⟨N0, (N2<N0<N3)⟩ ⟨N2, (N2<N0<N3)⟩ ⟨N3, (N2<N0<N3)⟩		2,5,6,7,8	2,4,6,8	1,3,5,7	2,3,4,5,7	
⟨N1, (N0=N1)⟩ ⟨N0, (N2<N0<N3)⟩ ⟨N2, (N2<N0<N3)⟩ ⟨N3, (N2<N0<N3)⟩	N0, (N0=N1)	2,6,8	2,4,6,8	1,3,5,7	2,3,4,5,7	
⟨N0, (N2<N0<N3)⟩ ⟨N2, (N2<N0<N3)⟩ ⟨N3, (N2<N0<N3)⟩	N1, (N0=N1)	2,6,8	2,6,8	1,3,5,7	2,3,4,5,7	
⟨N2, (N2<N0<N3)⟩ ⟨N3, (N2<N0<N3)⟩	N0, (N2<N0<N3)	2,6	2,6,8	1,3,5,7	2,3,4,5,7	N1, (N0=N1)

⟨N1, (N0=N1)⟩						
⟨N3, (N2<N0<N3)⟩ ⟨N1, (N0=N1)⟩	N2, (N2<N0<N3)	2,6	2,6,8	1,3,5	2,3,4,5,7	
⟨N1, (N0=N1)⟩	N3, (N2<N0<N3)	2,6	2,6,8	1,3,5	3,4,5,7	
	N1, (N0=N1)	2,6	2,6	1,3,5	3,4,5,7	

3. B.) on the next page


{2,6,8} {268} {1,3,5} {3,4,5,7}
N0 ∈ {2}
N0 ∈ {6}
{2} {2,6,8} {1,3,5} {3,4,5,7}
{6} {2,6,8} {1,3,5} {3,4,5,7}
AC
AC
{2} {2} {1} {3,4,5,7}
{6} {6} {1,3,5} {7}
N3 ∈ {3,4}
N3 ∈ {5,7}
N2 ∈ {1}
N2 ∈ {3,5}
{2} {2} {1} {3,4}
{2} {2} {1} {5,7}
{6} {6} {1,4} {7}
{6} {6} {3,5} {7}
AC
AC
AC
AC
{2} {2} {1} {3,4} {2} {2} {1} {5,7}
{6} {6} {1,4} {7}
{6} {6} {3,5} {7}
N3 ∈ {3}
N3 ∈ {4}
N3 ∈ {5}
N3 ∈ {7}
①
②
③
④
{2} {2} {1} {3,4}
{2} {2} {1,4} {4}
{2} {2} {1,4} {5,7}
{2} {2} {1} {7}
⑤
N2 ∈ {3}
N2 ∈ {5}
{6} {6} {1} {7}
⑥
⑦
{6} {6} {3} {7}
{6} {6} {5} {7}