CSE 4321: Software Testing and Maintenance

HW 3 (30 points)

Consider a system that consists of 4 parameters, P1, P2, P3, and P4. Each parameter has two values 0 and 1. Apply algorithm IPO to create a pairwise test set for this system. Use "-" to represent *don't care* values, i.e., values that do not affect coverage. Clearly indicate your tie-breaking rules that may be needed in the test generation process. You must show intermediate steps to obtain full credits.

Solution A. (tiebreaker: when selecting value for parameter in a test, if there are multiple values covering max number of uncovered pairwise combinations, choose the smallest value index)

P1	P2
0	0
0	1
1	0
1	1

P1 P3
~~0 0~~
~~0 1~~
~~1 0~~
~~1 1~~

P2 P3
~~0 0~~
~~0 1~~
~~1 0~~
~~1 1~~

=>

P1	P2	P3	
0	0	0	cov(0)=2 (note that possible coverage is no more than 2)
0	1	1	cov(0)=1, cov(1)=2
1	0	1	cov(0)=1, cov(1)=2
1	1	0	cov(0)=2

P1 P4
~~0 0~~
~~0 1~~
~~1 0~~
~~1 1~~

P2 P4
~~0 0~~
~~0 1~~
~~1 0~~
~~1 1~~

P3 P4
~~0 0~~
~~0 1~~
~~1 0~~
~~1 1~~

=>

P1	P2	P3	P4	
0	0	0	0	cov(0)=3 (note that possible coverage is no more than 3)
0	1	1	1	cov(0)=2, cov(1)=3
1	0	1	0	cov(0)=2, cov(1)=2, tiebreaker: choose the smallest value index as 0
1	1	0	1	cov(0)=1, cov(1)=2
-	0	-	1	
-	1	-	0	

Solution B. (tiebreaker: choose the largest value index)

P1	P2
0	0
0	1
1	0
1	1

P1 P3

~~0 0~~
~~0 1~~
~~1 0~~
~~1 1~~

P2 P3

~~0 0~~
~~0 1~~
~~1 0~~
~~1 1~~

=>

P1	P2	P3	
0	0	1	cov(0)=2, cov(1)=2, tiebreaker: choose the largest value index as 1
0	1	0	cov(0)=2, cov(1)=1
1	0	0	cov(0)=2, cov(1)=1
1	1	1	cov(0)=0, cov(1)=2

P1 P4

~~0 0~~
~~0 1~~
~~1 0~~
~~1 1~~

P2 P4

~~0 0~~
~~0 1~~
~~1 0~~
~~1 1~~

P3 P4

~~0 0~~
~~0 1~~
~~1 0~~
~~1 1~~

=>

P1	P2	P3	P4	
0	0	1	1	cov(0)=3, cov(1)=3, tiebreaker: choose the largest value index as 1
0	1	0	0	cov(0)=3, cov(1)=2
1	0	0	1	cov(0)=2, cov(1)=2, tiebreaker: choose the largest value index as 1
1	1	1	0	cov(0)=2, cov(1)=1
-	0	-	0	
-	1	-	1	