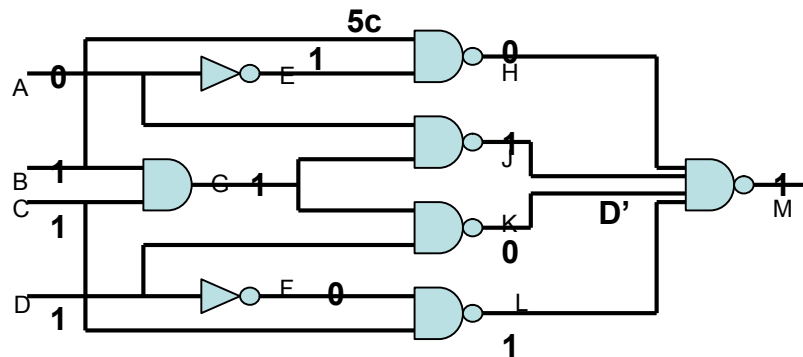


Examples for PODEM Algorithm

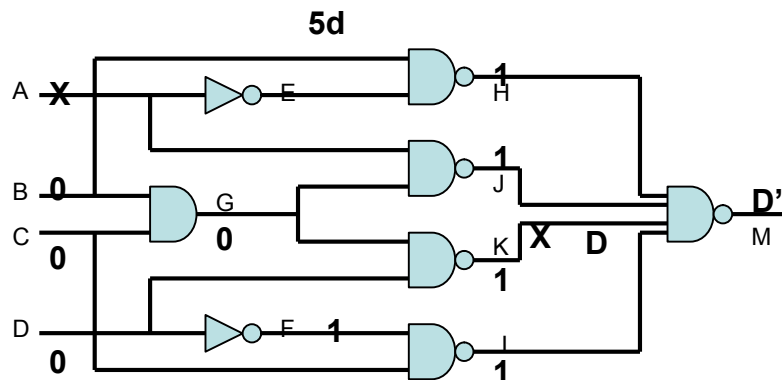
Consider fault K s-a-1:

- Step 1: OBJECTIVE(K=0) BACKTRACE(K=0). D=1 IS LIKELY VALUE. D IS A PI. SO SET D=1 AND CALL IMPLY-FORWARD. $\Rightarrow F=0, L=1, K=X$.
- Step 2: REPEAT BACKTRACE(K=0). LIKELY VALUE IS G=1. LIKELY VALUE FOR BACKTRACE(G=1) IS B=1. B IS PI, SO SET B=1 AND IMPLY FORWARD. $\Rightarrow G=K=X$.
- Step 3: REPEAT BACKTRACE(K=0). LIKELY VALUE IS G=1. LIKELY VALUE IS C=1. SET C=1 AND IMPLY FORWARD. $\Rightarrow G=1 \Rightarrow K=0$. SO **D'** AT LINE K IS ESTABLISHED.
- Step 4: TO **D**-DRIVE THROUGH M SET OBJECTIVE (J=1). BACKTRACE (J=1). LIKELY VALUE IS A=0. A IS PI, SO SET A=0 AND IMPLY-FORWARD. $\Rightarrow J=1; E=1 \Rightarrow H=0 \Rightarrow M=1$. SO NO **D** OR **D'** CAN BE DRIVEN TO THE PO, SO NO TEST EXISTS.

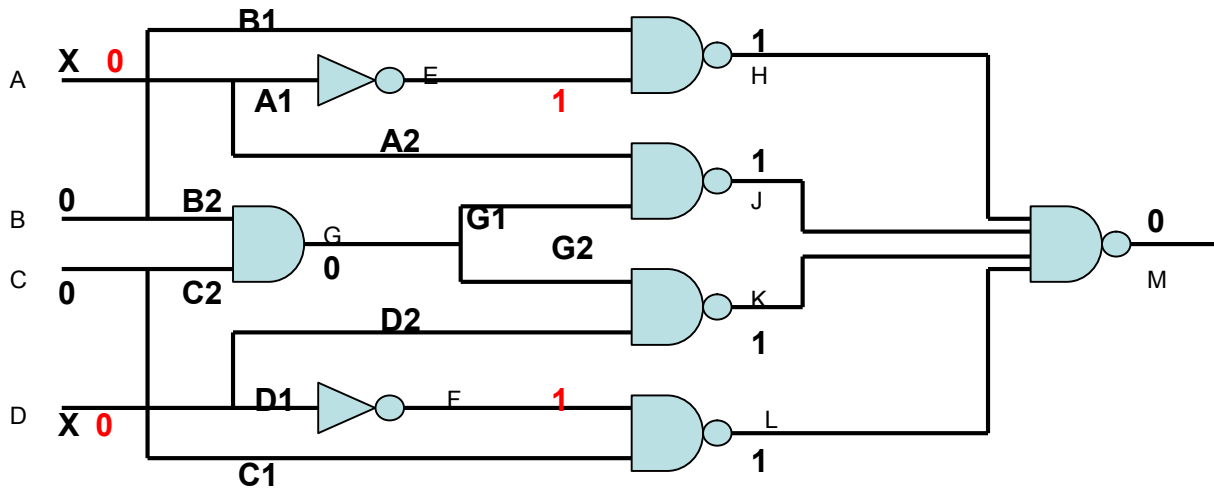


5d- K s-a-0. PODEM:

- Step 1: OBJECTIVE(K=1). BACKTRACE(K=1). LIKELY VALUE IS D=0. SET D=0; $\Rightarrow F=1, K=1$. SO K=**D** IS ESTABLISHED.
- Step 2: TO **D**-DRIVE THROUGH M, SET OBJECTIVE(L=1). BACKTRACING, A LIKELY VALUE IS C=0 WHICH IS A PI, SO C=0 $\Rightarrow G=0 \Rightarrow J=1; L=1$.
- Step 3: TO **D**-DRIVE THROUGH M, SET OBJECTIVE(H=1). BACKTRACING, WE GET B=0 AS A LIKELY VALUE. SETTING B=0 $\Rightarrow H=1 \Rightarrow M=D'$. THUS A TEST IS: (A, B, C, D)=(X, 0, 0, 0).



5e. We now determine all the single s-a-faults determined by the test pattern (x, 0, 0, x). Simulating this partially specified vector, we have the results as shown below. We see that if an error occurs on lines A, E, D or F, it will not propagate to an output, so the associated faults will not be detected.



To detect an error on B1, we want E=1, hence A=0. But to detect an error on G1, we want A2=1, hence A=1. So, in either case only one of these faults can be detected. Similarly, for line D. So we will set (A, B, C, D) = (0, 0, 0, 0). (See entries in red.)

The 11 faults detected are:

M SA1; H, J, K, L SA0; B1, B, D, D2, C, C1 SA1.