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| **Variables (can be answered as true  or false )** | **Rules** |
| * A= Have $10,000 * B= Older than 30 * C= Education at college level * D= Annual income of at least $40,000 * E= Invest in securities * F= Invest in growth stocks * G= Invest in IBM stock (the potential goal) | R1: IF A and C, THEN E  R2: IF D and C, THEN F  R3: IF B and E, THEN F  R4: IF B, THEN A  R5: IF F, THEN G |

Mary just graduated from Northwest Missouri State University and got a job with annual income of $70,000. Should she invest in IBM stock (yes or no)?  Use both forward and backward chaining inference to explain your decision. For each chaining, explain the facts, rule fires and how you make the decision.

Facts:

A = Not given, false.

B = Not given, false.

C = Given, True

D = Given, True

E = False

F = Eventually True

G = Eventually True

Forward Chaining:

C, D, and B are the assertion base. While B is incorrect, C and D are true. R4 is not fired, and we move to R2 which is fired at C&D. Since F is rendered true via R2, we move to the firing of R5 and giving us the end result of G.

~~B,~~ C, D → C&D →F → G

Backward Chaining:

G is correct as R2 is the baseline resulting in R5 firing leading to G from F. Next, we abandon R3 as B is not given and E is false, and as C & D are correct, R2 fires. C and D are correct, B is an unknown and we stop at D.

G → F → C &D → D

Conclusion:

Backward Chaining result = Mary should invest in IBM stock.

Forward Chaining Result = Mary should invest in IBM stock.

As rules R5 and R2 are correct; yes, Mary should invest in growth stocks owned by IBM.