

Given a set of rules and facts, you have to reason whether a statement is true or false. Here are some facts and rules:

- F1:  $r1(\text{maximilian}, \text{nina})$ .
- F2:  $r1(\text{maximilian}, \text{david})$ .
- F3:  $r1(\text{maximilian}, \text{lukas})$ .
- F4:  $r1(\text{lina}, \text{maximilian})$ .
- F5:  $r1(\text{lina}, \text{marie})$ .
- F6:  $r1(\text{clara}, \text{claudia})$ .
- F7:  $r1(\text{claudia}, \text{lea})$ .
- F8:  $r1(\text{sarah}, \text{paula})$ .
- F9:  $r1(\text{sarah}, \text{emma})$ .
- F10:  $r1(\text{angelina}, \text{victoria})$ .
- F11:  $r1(\text{adam}, \text{victoria})$ .
- F12:  $r1(\text{raphael}, \text{paula})$ .
- F13:  $r1(\text{raphael}, \text{emma})$ .
- F14:  $r1(\text{luca}, \text{maximilian})$ .
- F15:  $r1(\text{luca}, \text{marie})$ .
- F16:  $r1(\text{emma}, \text{julian})$ .
- F17:  $r1(\text{emma}, \text{leon})$ .
- F18:  $r1(\text{jonas}, \text{lea})$ .
- F19:  $r1(\text{daniel}, \text{julian})$ .
- F20:  $r1(\text{daniel}, \text{leon})$ .
- F21:  $r1(\text{olivia}, \text{nina})$ .
- F22:  $r1(\text{olivia}, \text{david})$ .
- F23:  $r1(\text{olivia}, \text{lukas})$ .
- F24:  $r1(\text{david}, \text{sarah})$ .
- F25:  $r1(\text{david}, \text{valentina})$ .
- F26:  $r1(\text{lukas}, \text{vincent})$ .
- F27:  $r1(\text{lukas}, \text{paul})$ .
- F28:  $r1(\text{victoria}, \text{sarah})$ .
- F29:  $r1(\text{victoria}, \text{valentina})$ .
- F30:  $r1(\text{valerie}, \text{vincent})$ .
- F31:  $r1(\text{valerie}, \text{paul})$ .
- F32:  $r1(\text{paul}, \text{claudia})$ .
- F33:  $r43(\text{maximilian})$ .

F34:  $r44(\text{lina})$ .

F35:  $r43(\text{luca})$ .

F36:  $r44(\text{olivia})$ .

F37:  $r43(\text{david})$ .

F38:  $r43(\text{lukas})$ .

F39:  $r44(\text{victoria})$ .

F40:  $r44(\text{valentina})$ .

F41:  $r44(\text{valerie})$ .

F42:  $r43(\text{paul})$ .

F43:  $r44(\text{clara})$ .

F44:  $r44(\text{claudia})$ .

F45:  $r44(\text{sarah})$ .

F46:  $r44(\text{angelina})$ .

F47:  $r43(\text{adam})$ .

F48:  $r44(\text{marie})$ .

F49:  $r43(\text{vincent})$ .

F50:  $r44(\text{nina})$ .

F51:  $r43(\text{raphael})$ .

F52:  $r44(\text{paula})$ .

F53:  $r44(\text{emma})$ .

F54:  $r43(\text{jonas})$ .

F55:  $r44(\text{lea})$ .

F56:  $r43(\text{daniel})$ .

F57:  $r43(\text{julian})$ .

F58:  $r43(\text{leon})$ .

L1:  $\forall A, B, C : r1(B, A) \wedge r1(B, C) \wedge r44(A) \rightarrow r2(A, C)$

L2:  $\forall A, B, C : r1(B, A) \wedge r1(B, C) \wedge r43(A) \rightarrow r3(A, C)$

L3:  $\forall A, B : r1(A, B) \wedge r44(A) \rightarrow r4(A, B)$

L4:  $\forall A, B : r1(A, B) \wedge r43(A) \rightarrow r5(A, B)$

L5:  $\forall A, B, C : r1(A, B) \wedge r1(B, C) \wedge r44(A) \rightarrow r6(A, C)$

L6:  $\forall A, B, C : r1(A, B) \wedge r1(B, C) \wedge r43(A) \rightarrow r7(A, C)$

L7:  $\forall A, B, C, D : r1(A, B) \wedge r1(B, C) \wedge r1(C, D) \wedge r44(A) \rightarrow r8(A, D)$

L8:  $\forall A, B, C, D : r1(A, B) \wedge r1(B, C) \wedge r1(C, D) \wedge r43(A) \rightarrow r9(A, D)$

L9:  $\forall A, B, C, D : r1(B, A) \wedge r1(B, C) \wedge r1(C, D) \wedge r44(A) \rightarrow r10(A, D)$

L10:  $\forall A, B, C, D : r1(B, A) \wedge r1(B, C) \wedge r1(C, D) \wedge r43(A) \rightarrow r11(A, D)$

- L11:  $\forall A, B, C, D, E : r1(B, A) \wedge r1(B, C) \wedge r1(C, D) \wedge r1(D, E) \wedge r44(A) \rightarrow r12(A, E)$
- L12:  $\forall A, B, C, D, E : r1(B, A) \wedge r1(B, C) \wedge r1(C, D) \wedge r1(D, E) \wedge r43(A) \rightarrow r13(A, E)$
- L13:  $\forall A, B, C, D, E, F : r1(B, A) \wedge r1(C, B) \wedge r1(C, D) \wedge r1(D, E) \wedge r1(E, F) \wedge r44(A) \rightarrow r14(A, F)$
- L14:  $\forall A, B, C, D, E, F : r1(B, A) \wedge r1(C, B) \wedge r1(C, D) \wedge r1(D, E) \wedge r1(E, F) \wedge r43(A) \rightarrow r15(A, F)$
- L15:  $\forall A, B, C, D, E : r1(B, A) \wedge r1(C, B) \wedge r1(C, D) \wedge r1(D, E) \wedge r44(A) \rightarrow r16(A, E)$
- L16:  $\forall A, B, C, D, E : r1(B, A) \wedge r1(C, B) \wedge r1(C, D) \wedge r1(D, E) \wedge r43(A) \rightarrow r17(A, E)$
- L17:  $\forall A, B, C, D, E, F, G : r1(B, A) \wedge r1(C, B) \wedge r1(D, C) \wedge r1(D, E) \wedge r1(E, F) \wedge r1(F, G) \wedge r44(A) \rightarrow r18(A, G)$
- L18:  $\forall A, B, C, D, E, F, G : r1(B, A) \wedge r1(C, B) \wedge r1(D, C) \wedge r1(D, E) \wedge r1(E, F) \wedge r1(F, G) \wedge r43(A) \rightarrow r19(A, G)$
- L19:  $\forall A, B, C, D, E, F : r1(B, A) \wedge r1(C, B) \wedge r1(D, C) \wedge r1(D, E) \wedge r1(E, F) \wedge r44(A) \rightarrow r20(A, F)$
- L20:  $\forall A, B, C, D, E, F : r1(B, A) \wedge r1(C, B) \wedge r1(D, C) \wedge r1(D, E) \wedge r1(E, F) \wedge r43(A) \rightarrow r21(A, F)$
- L21:  $\forall A, B : r1(B, A) \wedge r44(A) \rightarrow r22(A, B)$
- L22:  $\forall A, B : r1(B, A) \wedge r43(A) \rightarrow r23(A, B)$
- L23:  $\forall A, B, C : r1(B, A) \wedge r1(C, B) \wedge r44(A) \rightarrow r24(A, C)$
- L24:  $\forall A, B, C : r1(B, A) \wedge r1(C, B) \wedge r43(A) \rightarrow r25(A, C)$
- L25:  $\forall A, B, C, D : r1(B, A) \wedge r1(C, B) \wedge r1(D, C) \wedge r44(A) \rightarrow r26(A, D)$
- L26:  $\forall A, B, C, D : r1(B, A) \wedge r1(C, B) \wedge r1(D, C) \wedge r43(A) \rightarrow r27(A, D)$
- L27:  $\forall A, B, C, D : r1(B, A) \wedge r1(C, B) \wedge r1(C, D) \wedge r44(A) \rightarrow r28(A, D)$
- L28:  $\forall A, B, C, D : r1(B, A) \wedge r1(C, B) \wedge r1(C, D) \wedge r43(A) \rightarrow r29(A, D)$

Does it imply that the statement “ $r23(\text{vincent}, \text{lukas})$ .” is True? If the statement is True, please answer with “True”. Otherwise, please answer with “False”.