A Proof from PROTEIN*

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Abstract

This is just an experiment.

Axiom 0.1 (The transitivity of σ) $\sigma(A, B) \wedge \sigma(B, C) \rightarrow \sigma(A, C)$.

Axiom 0.2 (The transitivity of ρ) $\rho(A, B) \wedge \rho(B, C) \rightarrow \rho(A, C)$.

Axiom 0.3 (The symmetry of ρ) $\rho(A, B) \rightarrow \rho(B, A)$.

Axiom 0.4 (The fact that any two things are either related in the σ or in the ρ manner) $\sigma(A, B) \vee \rho(A, B)$.

Axiom 0.5 (The partiality of ρ) $\neg\ \rho(c, d)$.

Theorem 0.1 $\sigma(a, b)$.

Proof[1]. We show directly that

$$\sigma(a, b). \tag{1}$$

Let us consider arbitrary v_1, v_2, v_3, v_4.
We show indirectly that

$$\sigma(a, d). \tag{2}$$

Let us assume that

$$\neg\ \sigma(a, d). \tag{3}$$

We show indirectly that

$$\neg\ \rho(a, c). \tag{4}$$

Let us assume that

$$\rho(a, c). \tag{5}$$

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Hence by the symmetry of ρ $\rho(c, a)$. By (3) and by the fact that any two things are either related in the σ or in the ρ manner $\rho(a, d)$. Therefore by the transitivity of ρ $\rho(c, d)$. Hence by the partiality of ρ we have a contradiction.

Thus we have completed the proof of (4).

Hence by the fact that any two things are either related in the σ or in the ρ manner $\sigma(a, c)$.

We show indirectly that

$$\sigma(c, d). \tag{6}$$

Let us assume that

$$\neg\ \sigma(c, d). \tag{7}$$

We show indirectly that

$$\neg\ \rho(c, v_2). \tag{8}$$

Let us assume that

$$\rho(c, v_2). \tag{9}$$

By (7) and by the fact that any two things are either related in the σ or in the ρ manner $\rho(c, d)$. Hence by the partiality of ρ we have a contradiction.

Thus we have completed the proof of (8).

Hence by the fact that any two things are either related in the σ or in the ρ manner

$$\sigma(c, v_2). \tag{10}$$

We show indirectly that

$$\neg\ \rho(v_2, v_1). \tag{11}$$

Let us assume that

$$\rho(v_2, v_1). \tag{12}$$

By (7) and by the fact that any two things are either related in the σ or in the ρ manner $\rho(c, d)$. Hence by the partiality of ρ we have a contradiction.

Thus we have completed the proof of (11).

Hence by the fact that any two things are either related in the σ or in the ρ manner $\sigma(v_2, v_1)$. Hence by the transitivity of σ and by (10)

$$\sigma(c, v_1). \tag{13}$$

We show indirectly that

$$\neg\ \rho(v_1, v_3). \tag{14}$$

Let us assume that

$$\rho(v_1, v_3). \tag{15}$$

By (7) and by the fact that any two things are either related in the σ or in the ρ manner $\rho(c,d)$. Hence by the partiality of ρ we have a contradiction.

Thus we have completed the proof of (14).

Hence by the fact that any two things are either related in the σ or in the ρ manner

$$\sigma(v_1, v_3). \tag{16}$$

We show indirectly that

$$\neg\ \rho(v_3, d). \tag{17}$$

Let us assume that

$$\rho(v_3, d). \tag{18}$$

By (7) and by the fact that any two things are either related in the σ or in the ρ manner $\rho(c,d)$. Hence by the partiality of ρ we have a contradiction.

Thus we have completed the proof of (17).

Hence by the fact that any two things are either related in the σ or in the ρ manner $\sigma(v_3,d)$. Hence by the transitivity of σ and by (16) $\sigma(v_1,d)$. Hence by the transitivity of σ and by (13) $\sigma(c,d)$. This contradicts (7). Thus we have completed the proof of (6).

Hence by the transitivity of σ and since $\sigma(a,c)$ $\sigma(a,d)$. This contradicts (3). Thus we have completed the proof of (2).

We show indirectly that

$$\sigma(d, b). \tag{19}$$

Let us assume that

$$\neg\ \sigma(d, b). \tag{20}$$

We show indirectly that

$$\neg\ \rho(c, b). \tag{21}$$

Let us assume that

$$\rho(c, b). \tag{22}$$

By (20) and by the fact that any two things are either related in the σ or in the ρ manner $\rho(d,b)$. Hence by the symmetry of ρ $\rho(b,d)$. Therefore by the transitivity of ρ $\rho(c,d)$. Hence by the partiality of ρ we have a contradiction.

Thus we have completed the proof of (21).

Hence by the fact that any two things are either related in the σ or in the ρ manner $\sigma(c,b)$.

We show indirectly that

$$\sigma(d, c). \tag{23}$$

Let us assume that

$$\neg\ \sigma(d, c). \tag{24}$$

We show indirectly that

$$\neg\ \rho(d, v_4). \tag{25}$$

Let us assume that

$$\rho(d, v_4). \tag{26}$$

By (24) and by the fact that any two things are either related in the σ or in the ρ manner $\rho(d, c)$. Hence by the symmetry of ρ $\rho(c, d)$. Hence by the partiality of ρ we have a contradiction.

Thus we have completed the proof of (25).

Hence by the fact that any two things are either related in the σ or in the ρ manner

$$\sigma(d, v_4). \tag{27}$$

We show indirectly that

$$\neg\ \rho(v_4, c). \tag{28}$$

Let us assume that

$$\rho(v_4, c). \tag{29}$$

By (24) and by the fact that any two things are either related in the σ or in the ρ manner $\rho(d, c)$. Hence by the symmetry of ρ $\rho(c, d)$. Hence by the partiality of ρ we have a contradiction.

Thus we have completed the proof of (28).

Hence by the fact that any two things are either related in the σ or in the ρ manner $\sigma(v_4, c)$. Hence by the transitivity of σ and by (27) $\sigma(d, c)$. This contradicts (24). Thus we have completed the proof of (23).

Hence by the transitivity of σ and since $\sigma(c, b)$ $\sigma(d, b)$. This contradicts (20). Thus we have completed the proof of (19).

Hence by the transitivity of σ and since $\sigma(a, d)$ $\sigma(a, b)$. This completes the proof of (1).

q.e.d.