THE JORDAN-HÖLDER THEOREM WITH UNIQUENESS FOR GROUPS AND SEMIMODULAR LATTICES

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For subnormal subgroups $A \triangleleft B$ and $C \triangleleft D$ of a given group G, the factor B/A will be called *subnormally down-and-up projective* to D/C, if there are subnormal subgroups $X \triangleleft Y$ such that $AY = B$, $A \cap Y = X$, $CY = D$ and $C \cap Y = X$. Clearly, $B/A \cong D/C$ in this case. As G. Grätzer and J. B. Nation have just pointed out, the standard proof of the classical Jordan-Hölder theorem yields somewhat more than widely known; namely, the factors of any two given composition series are the same up to subnormal down-and-up projectivity and a permutation. We prove the *uniqueness* of this permutation.

The main result is the analogous statement for *semimodular lattices*. Most of the proof belongs to pure lattice theory; the group theoretical part is only a simple reference to a classical theorem of H. Wielandt.

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