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The Möbius function of generalized subword order

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Let P be a poset and let P* be the set of all finite length words over P. Generalized subword order is the partial order on P* obtained by letting u \le w if and only if there is a subword u' of w having the same length as u such that each element of u is less than or equal to the corresponding element of u' in the partial order on P. Classical subword order arises when P is an antichain, while letting P be a chain gives an order on compositions. For any finite poset P, we give a simple formula for the Mobius function of P* in terms of the Mobius function of P. This permits us to rederive in a easy and uniform manner previous results of Bjorner, Sagan and Vatter, and Tomie. We are also able to determine the homotopy type of all intervals in P* for any finite P of rank at most 1.

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