

Enumerating List Colorings

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The chromatic polynomial for enumerating graph colorings has a long history. We will examine how to extend these ideas to a polynomial for enumerating graph list colorings. We will have a polynomial in many variables that depends only on the graph, with evaluation depending on the sizes of intersections of the lists to count the number of list colorings. In particular we will very briefly see how three approaches to the classic chromatic polynomial; deletion-contraction, inclusion-exclusion and Möbius inversion can each be extended to the list coloring setting. Along the way we also get to explore some interesting history related to the classic chromatic polynomial.

Keywords: list coloring, chromatic polynomial