

Sum List Coloring

Brian Heinold
Mount Saint Mary's University
Emmitsburg, MD

An interesting variation on list coloring is sum list coloring. Suppose the vertices of a graph G are assigned lists of colors where the list sizes are specified by a function f . We say G is f -choosable if it can be properly colored from any lists whose sizes are given by f . How small can f be made while still having G be f -choosable? If we take the sum of the list sizes of f as our measure of smallness, then we have sum list coloring. The sum choice number of G is the minimum, taken over all functions f for which G is f -choosable, of the sum of the list sizes of f . (This is equivalent to minimizing the average list size.) One can easily show that the sum choice number never exceeds $|V(G)| + |E(G)|$. When does equality hold and what are some examples where it doesn't? We will provide some answers as well as some possibilities for future research.