

THE IDEAL CLASS MONOID OF AN ORDER IN A NUMBER FIELD

Let R be an order in a number field K . The *ideal class monoid of R* is defined as the set of fractional R -ideals modulo R -linear isomorphisms, with ideal product as multiplication. If R is the *maximal order* of K , then every fractional R -ideal is invertible and the ideal class monoid coincides with the class group of K . In particular there are well-known algorithms to compute it. On the other hand, if R is not a Dedekind domain, there are ideals that are not invertible and the situation is more complicated. We describe a method to compute a full set of representatives of the ideal class monoid of R and, if time permits, to describe an application to counting the conjugacy classes of integral matrices with a given irreducible characteristic polynomial.