

Let  $G, G'$  be abelian groups of order  $n$ , and let  $k = \mathbb{C}$ . Since  $k$  has no proper algebraic extensions, Wedderburn's Theorem implies that  $kG, kG'$  are both isomorphic (as  $k$ -algebras) to  $k \times \cdots \times k$  ( $n$  factors). But of course,  $G$  and  $G'$  need not be isomorphic!