

A Glimpse of Representation Theory

Representation Theory is the study of algebraic structures, such as groups, graphs, posets, associative or Lie algebras, by means of linear algebra. For a finite group G and a field F , the representation theory of the group algebra FG falls into two categories depending on the characteristic of the field and the order of the group. One is the case when the characteristic of the field is zero or the characteristic not dividing the order of the group, the other is the case when the characteristic of the field divides the order of the group which is referred as the modular representation theory. In the first case, contrary to the modular case, all indecomposable modules are irreducible. Besides, in the first case there is a classification of modules unlike the modular case. I will introduce the main structure theorems of the two cases, and will spend more time on the modular case, I will describe, the almost a decade old family, Modules of Constant Jordan Type and present some of my related results.

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