Introduction to Morita Equivalences

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Abstract

The aim of this talk is to define the notion of Morita equivalence between two rings A and B and to characterize the equivalences between the categories of modules over such rings.
It turns out that the two categories $Mod-A$ e $Mod-B$ are equivalent by means of a functor S if and only if there exist two bimodules ${}_AP_B$ and ${}_BQ_A$ with two bimodule isomorphisms ${}_BQ \otimes P_B \to B$ and ${}_AP \otimes Q_A \to A$, such that $S \simeq - \otimes_A P$.
Moreover we can choose the inverse equivalence of S to be the functor $T = Hom_B(P, -)$, that is right adjoint to S.
In the last part of the talk I will prove that the two rings A and B are Morita equivalent if and only if there is a finitely generated projective generator P_B in $Mod-B$ such that $A \cong End_B(P)$ and I will talk about some properties that are preserved by equivalences.

References

[1] Bo Stenström *Rings of quotients.* Bulletin of the American Mathematical Society 83 (1977)

[2] Robert R. Colby, Kent R. Fuller *Rings and categories of modules.* Springer-Verlag, Graduate text in mathematics, 2nd-ed. (1992).