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On generalization of Nakayama's Lemma

Let R be a commutative ring with identity. We will say that an R-module M has Nakayama property, if $IM = M$, where I is an ideal of R, implies that there exists $a \in R$ such that $aM = 0$ and $a - 1 \in I$.

Nakayama's Lemma is a well-known result which states that every finitely generated R-module has Nakayama property.

In this note, we will study Nakayama property for modules. It is proved that R is a perfect ring if and only if every R-module has Nakayama property.