TITLE: An introduction to non-abelian tensor products.

ABSTRACT: R. Brown and J. L. Loday first introduced the non-abelian tensor product $M \otimes N$ for groups M and N in context with an application in homotopy theory. Let M and N be groups which act on each other via automorphisms and which act on themselves via conjugation. The actions of M and N are said to be compatible, if ${}^{{}^{n}m}n' = {}^{nmn^{-1}}n'$ and ${}^{{}^{m}n}m' = {}^{mnm^{-1}}m'$ for all $m, m' \in M,\ n, n' \in N$. The non-abelian tensor product $M \otimes N$ is defined provided M and N act compatibly. In such a case $M \otimes N$ is the group generated by the symbols $m \otimes n$ with relations $mm' \otimes n = ({}^{m}m' \otimes {}^{m}n)(m \otimes n)$ and $m \otimes nn' = (m \otimes n)({}^{n}m \otimes {}^{n}n')$, where ${}^{m}m' = mm'm^{-1}$ and ${}^{n}n' = nn'n^{-1}$. We will discuss some basic properties of non-abelian tensor products and give examples of compatible actions and the resulting non-abelian tensor products.