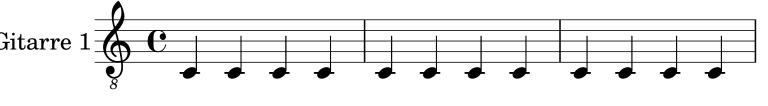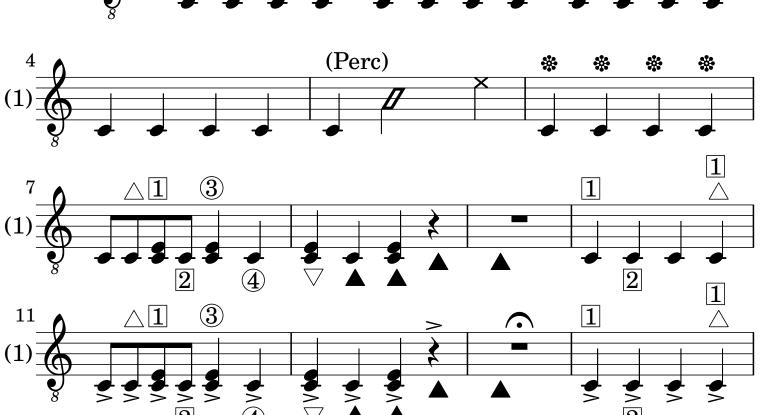# functions from head.ly