Multiple Hypotheses:

This subject refers to the statistical inference when more than one hypothesis are tested simultaneously. Suppose, one is interested in testing multiple null hypotheses, $H_0^i, i = 1, \dots, m$. One option is to test each individual hypothesis at a type-I error of α, then, given that all nulls are true, at least one hypothesis will be falsely rejected[1] with probability $1 - (1 - \alpha)^m$ assuming that independent tests are used to test $H_0^i, i = 1, \dots, m$. for example if $\alpha = 0.05 \; and \; m = 100$, this probability is 0.9941. This implies that given all 100 nulls are true, then, if the hypotheses are tested individually at type-I error of α using independent test statistics, at least one will be rejected falsely almost certainly. Of course, one may not care much about if only few hypotheses are rejected falsely especially when m is very large. In most of the applications, it may be sufficient to require the multiple hypotheses tests to have a given proportion of false discoveries[2].

1. This concept is called family-wise error rate (FWER)
2. This concept is called false discovery rate (FDR).