Classic methods for multiple comparisons

Bonferroni and Sidak

The simplest multiple comparison method is the ***Bonferroni correction***:

$$P_{\text{adjusted}} = k\, P_{min}.$$

Almost identical, and slightly more justified perhaps, is the ***Sidak correction***:

$$P_{\text{adjusted}} = 1 - (1 - P_{min})^{k} \quad , \text{ which is roughly } \quad k\, P_{min} - k\,(k\text{-}1)/2\, P_{min}^{\,2}$$

This is exactly correct when the k P-values are independent U(0,1) given H0.
Since the P values are generally positively correlated,
it is usually conservative (too big).

Non-independent cases

There are many many special adjustments in special cases to avoid being too conservative: Tukey LSD, Duncan range test, Dunnett's test, Neuman-Keuls, randomization tests, permutation tests,…