

Naïve association

FDR,  
Effect Size

Additional random  
effect lrt

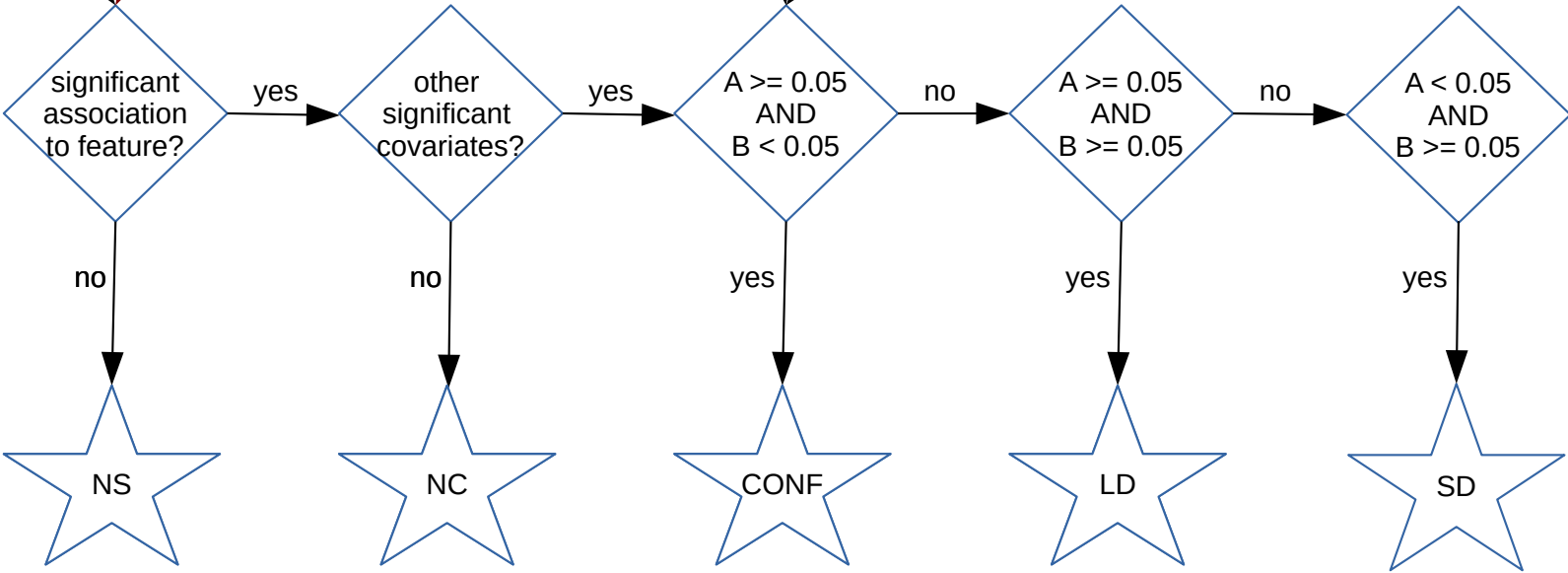
$$\frac{\text{lmer}(y \sim D + (1|R))}{\text{lmer}(y \sim (1|R))}$$

A

$$\frac{\text{lmer}(y \sim D + C1 + (1|R))}{\text{lmer}(y \sim D + (1|R))}$$

B

$$\frac{\text{lmer}(y \sim D + C1 + (1|R))}{\text{lmer}(y \sim C1 + (1|R))}$$



**Not Significant:** This covariate (D) is not significantly associated with the feature (y) in the first place or can be reduced to random effects (R).

**No other Coavriates:** This covariate is the only one significantly associated to the feature – it is trivially deconfounded.

**Association of this covariate and feature is confounded by another covariate (C1).** A **list of names** of all confounders will be returned as status.

**Laxly Deconfounded:** Another covariate is also associated but neither association is significantly stronger than the other.

**Strictly Deconfounded:** Another coavriate is associated to the feature, but the signal can be reduced to this covariate. This label is hardest to reach.