

Multiple comparison and bootstrap

Fix $j, k \in \{1, \dots, K\}$ such that $j < k$ and choose B to be sufficiently large.

- For each $b \in \{1, \dots, B\}$ independently:
 - For each $l, c \in \{1, \dots, K\}$ such that $l < c$:
 - Generate $(Y_{l1}^b)^*, \dots, (Y_{ln_l}^b)^*$ and $(Y_{c1}^b)^*, \dots, (Y_{cn_c}^b)^*$ as independent random samples with replacement from $Y_{l1} - \bar{Y}_{l+}, \dots, Y_{ln_l} - \bar{Y}_{l+}$ and $Y_{c1} - \bar{Y}_{c+}, \dots, Y_{cn_c} - \bar{Y}_{c+}$, respectively.
 - For the resampled datasets compute $p_{b*}^{(l,c)}$.
 - Let $p_{\min,b}^* = \min_{l < c} p_{b*}^{(l,c)}$

Finally, estimate the adjusted p -value $p^{(j,k)}$ as

$$p_{\text{adj}}^{(j,k)} = \frac{1 + \sum_{b=1}^B \mathbb{I}\{p_{\min,b}^* \leq p^{(l,c)}\}}{1 + B}.$$