NOTATIONS

\[ Y(x) = \text{Observed response at } x = (x_1, x_2, \ldots, x_k) \]

\[ \hat{Y}(x) = \text{Estimated response at } x = (x_1, x_2, \ldots, x_k) \]

\[ \frac{\partial \hat{Y}}{\partial x_1} = \text{Estimate of slope } \left( \frac{\partial \hat{Y}}{\partial x_1} \right) \text{ at } x = (x_1, x_2, \ldots, x_k) \]

\[ x_{ik} = \text{Level of } i\text{-th factor in the } k\text{-th run, in the response surface design (RSD)} \]

\[ a, a_1 \text{ etc.} = \text{Levels of the factors in cube/axial points in RSD} \]

\[ c = \text{Slope rotatability parameter in RSD} \]

\[ n_0 = \text{Number of central points in RSD} \]

\[ (n_0 = 10) = \text{Ten central points are taken in the design} \]

\[ N = \text{Total number of design points in the RSD} \]

\[ \text{CCD} = \text{Central composite design} \]

\[ \text{SORD} = \text{Second order rotatable design} \]

\[ \text{SOSRD} = \text{Second order slope rotatable design} \]

\[ \text{BHSORD} = \text{Box-Hunter second order rotatable design} \]

\[ \text{HPSOSRD} = \text{Hader-Park second order slope rotatable design} \]

\[ \text{SRCCD} = \text{Slope rotatable central composite design} \]

\[ \text{IBD} = \text{Incomplete block design} \]

\[ \text{BIBD} = \text{Balanced incomplete block design} \]
PBD = Pairwise balanced design

\((v, b, r, k, \lambda)\) = Parameters of BIBD

\((v, b, r, k_1, k_2, \ldots, k_p, \lambda)\) = Parameters of PBD

\(2^t(k)\) = Smallest fractional replicate of \(2^k\) factorial design with levels \(\pm 1\), such that no interaction with less than five factors is confounded

\(a-(v, b, r, k, \lambda)\) = \(a\)-combinations in the unknown level \(a\), generated through BIBD

\(\sum^1-\left(v, b_1, r_1, k_1, \lambda\right)\) = Design points generated from blocks of sizes \(k_1\) and \(k_2\) respectively from a given BIBD with unequal block sizes

'multiplication' = Multiplication of symbol combinations with associate combinations in Das and Narasimham sense

\(\sum^a-\left(v, b, r, k, \lambda\right)\) \(\times 2^t(k)\) = \(b \times 2^t(k)\) design points through 'multiplication' from BIBD \((v, b, r, k, \lambda)\)

\((a, 0, \ldots, 0) \times 2^1 = 2^v\) - design points obtained through 'multiplication', from the axial points set \((a, 0, \ldots, 0)\)

\((a, a, \ldots, a) \times 2^t(v) = \) Design points obtained through 'multiplication', from the cube points set \((a, a, \ldots, a)\)
\( n_a(a, 0, \ldots, 0) \times 2^1 = n_a \) replicates of axial points
\[ \text{set } (a, 0, \ldots, 0) \times 2^1 \]

\[ A \cup B = \text{Combination of the two sets of design points} \]
\[ A \text{ and } B \text{ (not the set union operation)} \]

\( a_L = \text{Lower bound of the level } a \)
\( a_U = \text{Upper bound of the level } a \)
\( c_L = \text{Lower bound of } c \)
\( c_U = \text{Upper bound of } c \)
\( n_oL = \text{Lower bound of } n_o \)
\( n_oU = \text{Upper bound of } n_o \)
\( a_r = \text{Rounded off value of level } a \)
\( c_r = \text{Recalculated value of } c \text{ based on } a_r \)
\( \varepsilon = \text{Disturbance of spherical variance function} \)