Exercise 1. Databases and the corresponding retrieval tools
(i) Use the retrieval tools GENPOS, WYCKPOS, NORMALIZER and WYCKSETS for accessing the ITA and ITA1 data;
(ii) Compare the k-vector tables and Brillouin zones for the different sets of parameters for the arithmetic crystal class 222F.

Exercise 2. Subgroups of space groups (SUBGROUPGRAPH)
(i) Consider the group-subgroup pair \( P4_{1}2_{1}2 > P2_{1} \)
   - obtain the general contracted graph;
   - get and compare the group-subgroup contracted graph and complete graph for \( P4_{1}2_{1}2 > P2_{1} \), index 4.
(ii) Determine the graph of maximal subgroups for the symmetry break \( P6_{3}/mmc > C2/m \) of index 6.

Exercise 3. Supergroups of space groups (MINSUP)
(i) Determine the supergroups \( P422 \) of \( P222 \) of index 2. How does the result depend on the normalizer of the supergroup and/or that of the subgroup?
(ii) Determine the minimal supergroups \( Cmcm \) of \( Pnma \).
(iii) Consider the minimal supergroups of \( Pna2_{1} \). Explain the differences between the transformation matrix of the \( Pnma > Pna2_{1} \) group-subgroup pair and that of the \( Pnma > Pna2_{1} \) supergroup-group pair?

Exercise 4. Splittings of Wyckoff positions (WYCKSPLIT)
(i) Consider the group-subgroup pair \( P4_{2}/mmm > Cmmm \) of index 2. Determine the Wyckoff position splitting of \( 2a \) and \( 4d \) orbits.
(ii) Determine the Wyckoff position splitting schemes for \( P6_{3}/mmc > C2/m \), index 6, for atoms occupying \( 2a \), \( 2d \) and \( 6h \)-orbits of \( P6_{3}/mmc \). Are there any differences between the splitting schemes for the different \( C2/m \) subgroups?