Priority Queues and Pattern Classes

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A priority queue is a container into which new items can be inserted and items removed: the item removed is always the smallest item in the container. A sequence of insert and remove operations therefore transforms an input sequence into an output sequence. Let X be any pattern class and consider the set X* of possible output permutations when the permutations of X are presented as input to a priority queue. In general X* is larger than X but it is still a pattern class. We determine the pattern classes X* that arise when X is taken to have a basis of permutations of length 3. In particular we prove that X* is finitely based in this case. We also give an example of a pattern class X with a basis permutation of length 4 for which X* is not finitely based.