About the Heuristics

3PixelRule.tiff ¬

Iterative Broadening

This technique is not a heuristic, but rather an extension of depth first search.   The program limits the number of different letters it considers at each square.   The first time through, it only looks at the best letter for each square.   The second time through, it looks at the best two letters, and so forth.   If you watch the program with iterative broadening turned on, you'll notice at the very beginning that it quickly erases everything it's done.   That's the point at which it increases the branch bound from 1 to 2.

It is wasteful to erase work and start over, but iterative broadening nevertheless almost always speeds up the search.   It works because it forces the search to examine widely separated parts of the search tree.   Since solutions tend to cluster, the program is more likely to stumble onto a good combination of letters and less likely to waste time searching down blind alleys.

Best Square

This heuristic instructs the search to focus on whichever square it thinks will be the most difficult to fill with a letter.   The idea is to identify trouble spots as quickly as possible.   The best square heuristic is a very good one.   Try turning it off and you'll see why!

Best Letter

Using this heuristic, the search chooses the best letter possible for the square it has chosen to fill.   It's guessing, of course, about which letter will be best, but it generally has a fairly good idea from looking at the crosswords that intersect the square.   This heuristic is also a good one.