HEURISTIC FOR BLOCKS WORLD

The heuristic is based on the approach to calculate the number of moves required to reach the goal state. In any particular state, the heuristic increments by 1 for the number of blocks in any stack other than the first stack (which will finally contain all the blocks). And for the first stack, it checks how many elements needed to be popped out and how many elements need to be pushed in after the popping is done so that we get the goal state and adds that total number of blocks to the heuristic. Now it looks ahead and checks if any element on top of a stack can directly go to the first stack if the first stack is in order already. If it is so, then it decreases the heuristic by one to favor this transition.

The heuristic that is being used in the program slightly over-estimates the cost to reach the goal and thus is inadmissible. This is because the number of blocks that need to be pushed into the first stack may overlap with the number of blocks that need to be popped from the other stacks to make the other stacks empty. And since both the number of blocks are being added to the heuristic, it may over-estimate the cost to reach the goal.