# Bonus HW

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**References Used:**

1) https://github.com/ani94/8-puzzle-solver-cpp/blob/master/8puzzle.cpp
2) https://stackoverflow.com/questions/36108269/does-8-puzzle-solvability-rules-work-for-any-goal-state

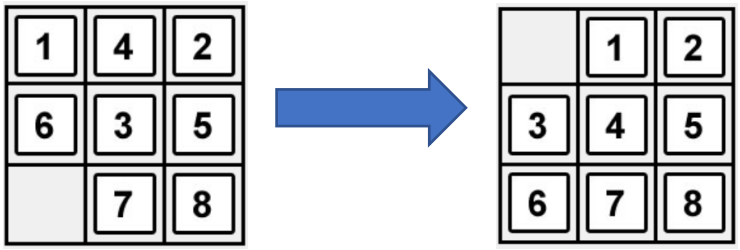
**1) URL to NCSU Github Repository:** https://github.ncsu.edu/sshekha4/Bonus-HW

**1.1)** Code is well-written and commented: Above Github link contains code which has references attached as comments to the top of the code page and is properly commented.

**2) Code execution on the example in the given assignment:**

The program needs 10 command line arguments. First argument indicates the heuristic to be used. Value of 0 represents that constant 0 heuristic will be used. Value of 1 indicates that the sum of the Manhattan Distances of each square from its current to its goal position will be used as the heuristic.

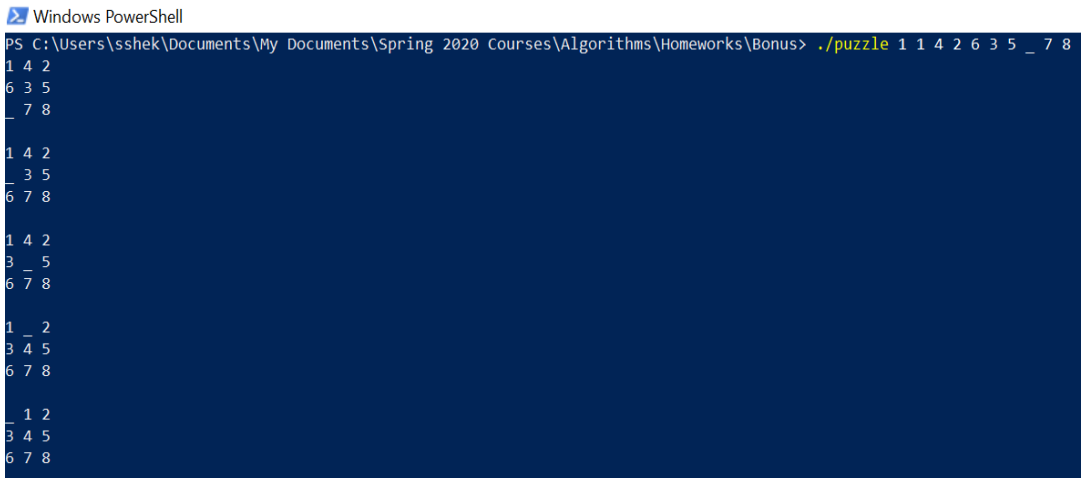
**Example***:* For the 8-puzzle problem given in the assignment, i.e.




To use Manhattan Distance as the heuristic to solve it, below command needs to be executed [puzzle represents the filename containing the puzzle code, 1 following the text puzzle represents the heuristic Manhattan Distance will be used and the remaining 9 arguments is the input state to the graph]:

To run: puzzle 1 1 4 2 6 3 5 _ 7 8

Output:



3) **My Tests:**

   **Note: Place all files from the github link in the same directory for successful execution.**

   I have written 4 tests (2 tests per heuristic). These tests are present in a batch file uploaded to the above mentioned github link. The file is names "**tests.bat".**
   **To run "tests.bat", simply double-click it. This will create 4 text files (1 per testcase) with the output in the same directory as the batch file named ri.txt where i stands for the file number. Example: for test 1, file r1.txt will be generated with the output.**

4) **Answers to the above tests from Step 3 (My Tests) are present in the respective text files generated by running the batch file "tests.bat". All details mentioned above in Step 3.**

5) **Correctly formatted output for the assignment example is shown above.**