Lab Assignment-4

Note: As a data scientist, you have been assigned a job to solve the 8-puzzle problem. To generate the states of the search space, you need to define the rules/operators properly. As a solution, you need to print the intermediate steps of the solution as well as total number of moves used to achieve the goal state.

1	If the initial and final states are as below and H(n): number of misplaced tiles in the current state n as compared to the goal node need to be considered as the heuristic function. You need to use **Best First Search** algorithm.
	Initial: <table><tr><td>2</td><td></td><td>3</td></tr><tr><td>1</td><td>8</td><td>4</td></tr><tr><td>7</td><td>6</td><td>5</td></tr></table> Goal: <table><tr><td>1</td><td>2</td><td>3</td></tr><tr><td>8</td><td></td><td>4</td></tr><tr><td>7</td><td>6</td><td>5</td></tr></table>
2	If the initial and final states have been changed as below and approach you need to use is **Hill Climbing searching algorithm.** H(n): number of misplaced tiles in the current state n as compared to the goal node as the heuristic function for the following states.
	Initial State: <table><tr><td>2</td><td>8</td><td>3</td></tr><tr><td>1</td><td>5</td><td>4</td></tr><tr><td>7</td><td>6</td><td></td></tr></table> (Ctrl) ▾ Final State: <table><tr><td>1</td><td>2</td><td>3</td></tr><tr><td>8</td><td></td><td>4</td></tr><tr><td>7</td><td>6</td><td>5</td></tr></table>
3	Apply A* **searching algorithm** by taking H(n): number of correctly placed tiles in the current state n as compared to the goal node. as the heuristic function.
	Initial: <table><tr><td>2</td><td></td><td>3</td></tr><tr><td>1</td><td>8</td><td>4</td></tr><tr><td>7</td><td>6</td><td>5</td></tr></table> Goal: <table><tr><td>1</td><td>2</td><td>3</td></tr><tr><td>8</td><td></td><td>4</td></tr><tr><td>7</td><td>6</td><td>5</td></tr></table>
4	Apply **AO* searching algorithm** on the following search tree.