CS217 **Artificial Intelligence and Machine Learning** **Lab Midsem**

20Feb25 **2.10 PM to 5.10 PM** **20 marks**

You must implement the 8-Queen problem by A* (strictly A* and nothing else). The task is to place 8 queens on a chessboard such that they do not come in line with one another. The queen-we know- can move any number of steps within the board horizontally, vertically, and diagonally.

Just so you know, several of the following should be clear from your code and comments therein (without comments and the clarity of the code, many of the following will attract 0).

(i) Define the state accurately (2 marks)
(ii) Define the operators completely and correctly (2 marks)
(iii) Give the cost() and the g() functions (2 marks)
(v) Give the performance for h()=0 (the baseline) (4 marks)
(vi) Give the performance of the program with the heuristic you have come up with; make sure the heuristic satisfies the monotone restriction (6 marks)
(vii) Come up with another heuristic that is inferior/superior to the previous one and is monotonic; compare the performances with h=0 and the previous one's. (4 marks)

IMP: your code MUST work

==========End==========