Indian Institute of Engineering Science & Technology, Shibpur
Department of Computer Science & Technology
8th Semester Artificial Intelligence Laboratory 2025
CS 4271
ASSIGNMENT – 1

1. Create a program designed to address a classic optimization challenge involving the determination of the most efficient route among a set of cities. In this problem, the objective is to find the shortest possible path that visits each city exactly once, returning to the starting city. The program should adeptly explore and assess potential routes, providing an optimal solution. Accomplishing this task necessitates the incorporation of an algorithm, whether heuristic or exact, capable of efficiently navigating the intricacies inherent in identifying the shortest path within a specified collection of cities. Use the hill climbing algorithm to solve the problem.

2. In the realm of Artificial Intelligence, contemplate a problem involving two containers of indeterminate capacity, referred to as jugs. One jug has a capacity of 3 units, while the other holds up to 4 units. There is no markings or additional measuring instruments, the objective is to develop a strategic approach to precisely fill the 4-unit jug with 2 units of water. The restriction stipulates the use of solely the aforementioned jugs, excluding any supplementary tools. Both jugs initiate the scenario in an empty state. The aim is to attain the desired water quantity in the 4-unit jug by executing a sequence of permissible operations, including filling, emptying, and pouring water between the jugs. The challenge in this scenario involves crafting an algorithm, such as Depth First Search, to systematically explore and determine the optimal sequence of moves for accomplishing the task while adhering to the defined constraints.