Week 5: Lab Programs

Question 1: Artificial Intelligence

The Traveling Salesman Problem (TSP) is: *"Given is a list of cities and distances between each pair of cities - what is the shortest route that visits each city and returns to the original city?"* Consider the *symmetric variant of the TSP (sTSP), where the cost from city j to city i equals the cost from city i to city j.*

1. Download the TSPLIB dataset, which contains graphs with cities as nodes & the distances between them, either in tsp or XML format
   http://comopt.ifi.uni-heidelberg.de/software/TSPLIB95/
   The documentation is available in :
   http://comopt.ifi.uni-heidelberg.de/software/TSPLIB95/tsp95.pdf

2. Consider the following datasets: **rd100.tsp, eil101.tsp, a280.tsp, d198.tsp and ch150.tsp**. For each dataset:
   a. compute the distance matrices between cities.
   b. Assess the performance of three Hill Climbing Algorithms in solving the TSP.
      i. Simple Hill Climbing
      ii. Stochastic Hill Climbing
   c. Tabulate results and comment on the best local search method for all datasets.

Q2. Deep Learning Lab Exercise: Building a Transfer Learning for **flower classification dataset** .

Task: Consider the **dataset**

https://storage.googleapis.com/download.tensorflow.org/example_images/flower_photos.tgz",
Implement **Transfer Learning** using **MobileNetV2** to classify flower images.

(a) Outline the steps to preprocess the dataset and modify MobileNetV2 for classification.
(b) Mention one benefit of using **MobileNetV2** for this task.
(c) Compare the pretrained model performance with CNN