K-Nearest Neighbors (KNN) Classification with Different Distance Metrics

1. Download Animals with Attributes (AwA2) dataset **from** https://cvml.ist.ac.at/AwA2/. This dataset consists of 37322 images of 50 animal classes with pre-extracted deep learning features for each image. You can also download the dataset from Baidu Cloud: https://pan.baidu.com/s/1CkBJ3vWWZfohLmSXDUcYfA?pwd=d6fj. Split the images in each category into 60% for training and 40% for testing (use the same training/test split as in Project 1). You can use K-fold cross-validation within the training set to determine hyper-parameters, such as K in KNN.

2. Use KNN for image classification based on **t**he deep learning features.

3. When measuring the distance between two samples, try two simple distance metrics (Euclidean distance, Manhattan distance) and explore which metric can achieve the optimal performance.

4. Use one metric learning method to learn a good metric, which can help improve the performance of KNN.

5. Write a project report in English using the provided LaTeX template. The project report should contain experimental setting (i.e., dataset, feature, training/testing split), the distance metrics and metric learning methods you tried, the experimental results you obtained, the experimental observations based on your experimental results.