**Abstract**

This report presents a study on Content-Based Image Retrieval (CBIR) using the CIFAR-10 dataset. It focuses on the retrieval of images based on RGB histogram comparisons and Manhattan Distance calculations. The report summarizes the methodology, implementation, and findings of the study.

# Introduction

The purpose of this assignment is to explore and implement a system for Content-Based Image Retrieval (CBIR) using the CIFAR-10 dataset. This dataset is widely used in the field of image processing and machine learning for benchmarking algorithms. The report discusses the dataset, the approach for image retrieval, and the relevance of the techniques used.

# Methodology

The CIFAR-10 dataset was chosen for this study. It consists of 60,000 32x32 color images in 10 different classes, including birds, cats, deer, dogs, and frogs. The dataset was preprocessed, and RGB histograms were computed for each image. The Manhattan Distance was used to measure similarity between images. This section details the data preparation, histogram computation, and similarity measurement techniques.

# Implementation

Python programming language, along with libraries such as NumPy and Matplotlib, was used for the implementation. The code is structured to load the dataset, preprocess images, compute histograms, and calculate image similarities. Challenges faced during implementation and their solutions are discussed in this section.

# Results and Discussion

This section presents the results obtained from the image retrieval system. It includes a discussion on the system’s performance, the effectiveness of the chosen methods, and an analysis of specific cases where the system performed well or poorly.

# Conclusion

The conclusion summarizes the achievements of the study and reflects on the learning outcomes. It also provides suggestions for further improvements and potential areas for future research in the field of image retrieval.

# References

1. Krizhevsky, A. (2009). Learning Multiple Layers of Features from Tiny Images. Master's thesis, Department of Computer Science, University of Toronto.

# Appendices

Appendix A: Python Code for the Assignment