Project Summary

Multi-class Image classification
This repository contains a project on building a Convolutional Neural Network (CNN) model for multi-class classification of images into six categories: Buildings, Forest, Glacier, Mountain, Sea, and Street. The model is implemented using TensorFlow and Keras and achieves an impressive accuracy of 98%.

Model Architecture
The CNN architecture used in this project is as follows:

Input Layer: Images resized to (150, 150, 3)

Conv2D Layers: Three convolutional layers with increasing filter sizes (32, 64, 128) and kernel size (3, 3), using ReLU activation and 'same' padding

MaxPooling2D Layers: After each Conv2D layer to reduce spatial dimensions

Dropout Layers: Dropout rate of 0.5 and 0.2 added after flattening to prevent overfitting

Flatten Layer: To convert 2D matrix data to a 1D vector

Dense Layers: One dense layer with (1024,256,128,64) units and ReLU activation

Output Layer: Dense layer with 6 units and soft-max activation for multi-class classification

Training Details:
Optimizer: Adam

Loss Function: Sparse Categorical Crossentropy

Metrics: Accuracy

Epochs: 30

Batch Size: 32

Data Augmentation: Applied to prevent overfitting

Dataset: Image dataset divided into training(13333), validation(1403), and test(3000) sets.

Performance:
Training Loss: 1.5%

Validation Loss: 6.8%

Accuracy: 98%

Conclusion:
This project demonstrates an effective approach to multi-class image classification using CNNs. The high accuracy and well-managed overfitting make this model suitable for deployment in various image classification tasks.