Data Collection and Preprocessing Phase

Date	29 November 2024
Team ID	739668
Project Title	Unveiling Climate Change Dynamics Through Earth Surface Temperature Analysis.
Maximum Marks	6 Marks

Preprocessing Template

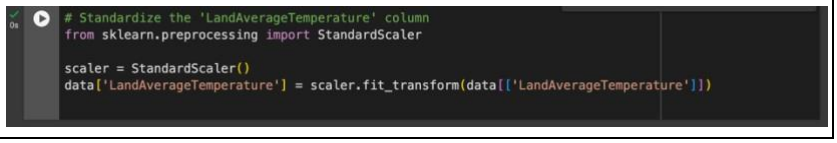
The images will be preprocessed by resizing, normalizing, augmenting, denoising, adjusting contrast, detecting edges, converting color space, cropping, batch normalizing, and whitening data. These steps will enhance data quality, promote model generalization, and improve convergence during neural network training, ensuring robust and efficient performance across various computer vision tasks.

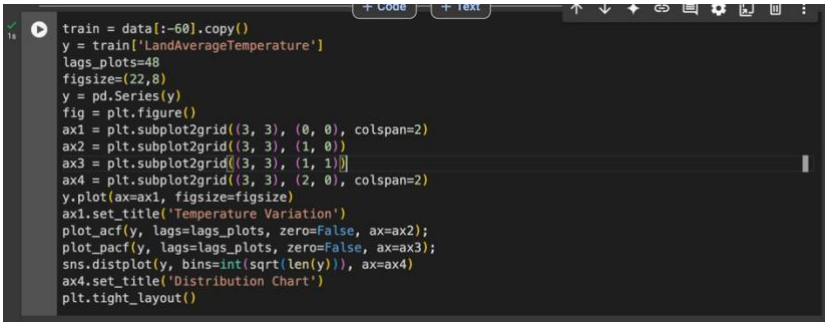
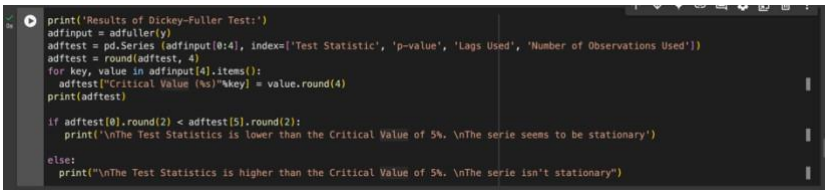
Section	**Description**
Data Overview	Use historical temperature datasets from reliable sources like NASA or NOAA, spanning several decades to analyze trends.
Spatial Data Aggregation	Not applicable for temperature data; instead, focus on aggregating data by spatial and temporal granularity (e.g., yearly averages).
Temperature Standardization	Normalize temperature values (e.g., Z-score normalization) for effective comparison across regions and timeframes.
Synthetic Data Generation	Augment data by interpolating missing values, creating synthetic time-series data to improve model performance.

Noise Reduction in Measurements	Apply smoothing techniques to remove outliers or noise in time-series temperature data.
Trend Change Detection	Detect changes or breaks in trends (e.g., sudden temperature rise) using change-point detection methods.

Heatmap Visualization	Convert temperature data into heatmap visualizations for geographic comparisons.
Regional Segmentation	Segment temperature data by geographic regions or time intervals to focus on specific trends or anomalies.
Standardized Data Inputs	Integrate batch normalization layers in the neural network to speed up training and enhance the model's performance.

Data Preprocessing Code Screenshots

Loading Data	
Spatial Data Aggregation	
Temperature Standardization	

Synthetic Data Generation	
Trend Change Detection	
Noise Reduction in Measurements	NO

Heatmap Visualization	
Regional Segmentation	
Standardized Data Inputs