Temperature Trend Analysis System - Summary Report

1. Simulation Models

Primary Model: Polynomial Regression (2nd degree)

Uses quadratic equation ($y = ax^2 + bx + c$)
Best for long-term predictions
Includes accuracy measurement (R^2 value)

Alternative Model: Moving Average

Based on last 5 years of data
Calculates recent temperature trends
More suitable for short-term predictions

2. Input Variables

Key Inputs

Year to Predict: Range 2024-2100
Historical Data: Annual means and 5-year smoothed temperatures
Model Selection: Choice between polynomial and moving average

3. GUI Features

User Interface

Clean, intuitive model selection
Year input with validation
Real-time error feedback
Loading indicators for data processing

Visualization

Interactive temperature trend chart
Multiple data series display
Clear results panel showing:
Predicted temperature
Model equation/description
Confidence metrics
Warning messages for extreme predictions

The system combines scientific accuracy with user-friendly design, making temperature trend analysis accessible while maintaining analytical rigor.