

Engineering Project 2: Automated Tool Log and Alarm Extraction

Problem statement

- Parse multiple semiconductor tool log CSV files, consolidate them into a single dataset, and automatically flag out-of-threshold process parameters at the cell and row level.
- Produce a clear alarm output with an alarm indicator (1/0) and export an alarm report to alarm.xlsx (with highlighted offending cells).

The problem this project solves

- Eliminates manual, error-prone scanning of large log files to find excursions.
- Standardizes alarm detection logic across runs by applying consistent, configurable thresholds per parameter.
- Converts raw logs into actionable outputs: alarm count, alarm rows, and a shareable Excel alarm list.

Applications

- Daily/shift process monitoring: quickly detect excursions in key parameters (e.g., pressure, RF power, temperature).
- Troubleshooting and root-cause triage: isolate the exact timestamp/run and parameter(s) that exceeded limits.
- Manufacturing analytics pipeline: generate structured alarm datasets for dashboards, SPC, and long-term trend tracking.
- Automation-ready reporting: integrate into batch workflows to auto-export alarm summaries for engineering review.

Why it's important

- Faster excursion detection reduces scrap risk and improves tool uptime by catching issues early.
- Creates a repeatable, auditable alarm workflow that supports process control discipline.
- Scales from a few CSVs to large log directories without changing the core approach, enabling consistent monitoring as data volume grows.

