Week 2 Report — Architecture & Spike

Lightweight System Resource Monitor
Theint No No Aung – 68011567

Ye Khaung Soe – 68011975

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1. ARCHITECTURE.md

State Model

- sys: System — system information handle

- cpu_usage: f32 — current CPU usage

- memory_used: u64 — used memory

- memory_total: u64 — total memory

- current_screen: Screen — active screen (Overview, Processes, Settings)

- dark_mode: bool — theme toggle

Message Flow

- Tick → refreshes system data every 1s

- GoToOverview / GoToProcesses / GoToSettings → navigation

- ToggleTheme → flips between light/dark

Data Sources

- sysinfo crate → CPU, memory, processes

- iced crate → GUI

- tokio → async runtime (used by Iced)

- serde + toml → planned for config persistence

Error Handling Strategy

- Graceful defaults (show "N/A" if data missing)

- No destructive actions (read-only monitor)

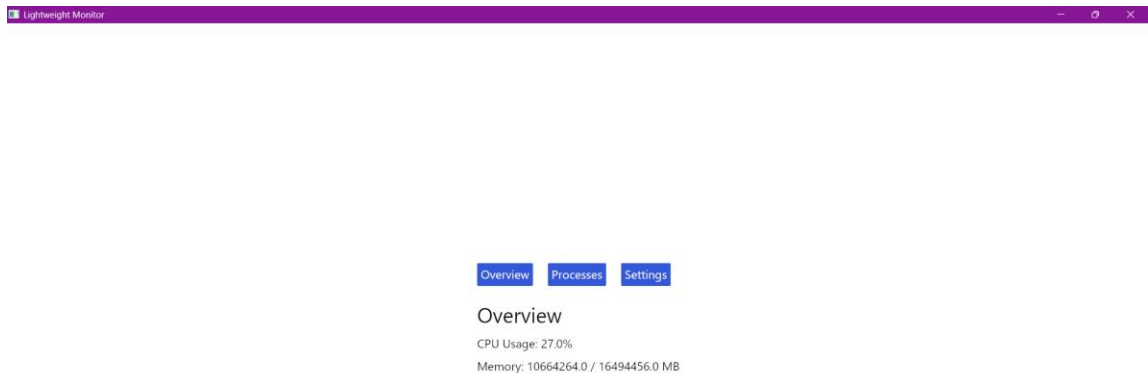- Future logging for debugging

- Config parsing with defaults

Risks & Mitigation

- Rust/Iced learning curve → start minimal

- Async refresh complexity → use Iced subscriptions

- Scope creep → stick to read-only monitoring

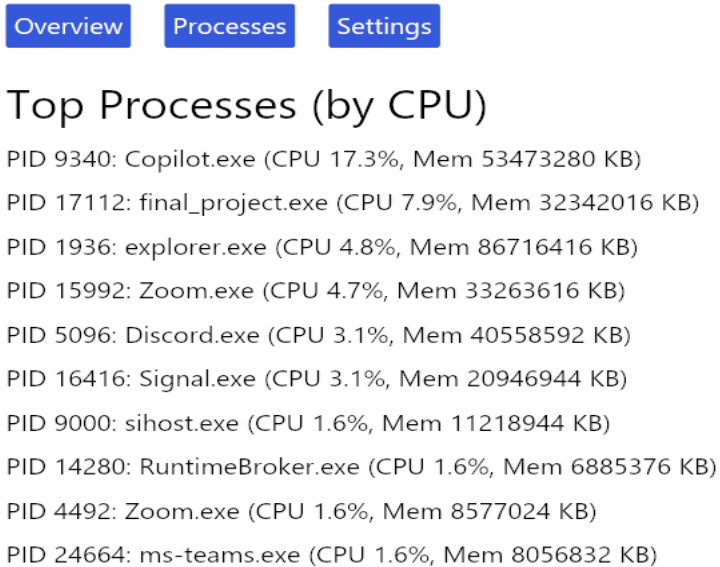- Cross-platform issues → focus on Linux first

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2. Iced Shell Application

- Project initialized with Cargo (cargo new final_project --bin).

- Builds successfully with cargo build.

- Runs with cargo run and opens an Iced window.

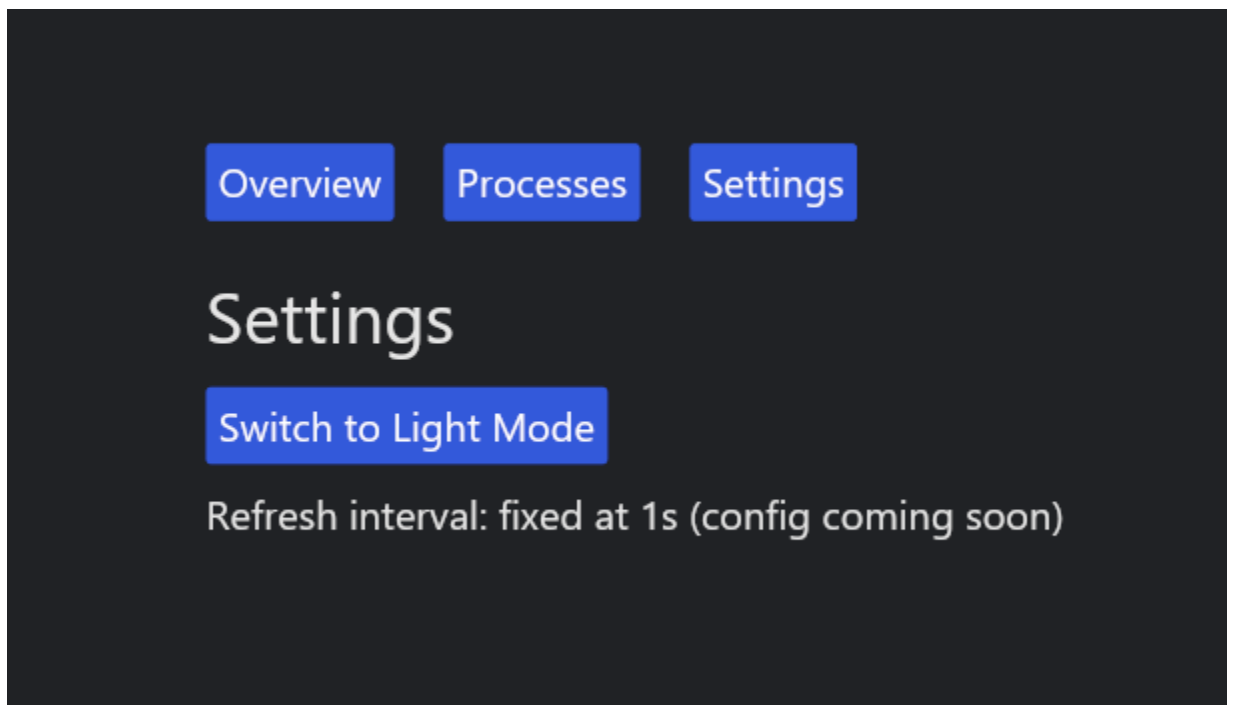- Navigation bar allows switching between three screens.

Additional Screens

- Processes Screen: Displays top 10 processes by CPU usage.

Overview   Processes   Settings

Top Processes (by CPU)

PID 9340: Copilot.exe (CPU 17.3%, Mem 53473280 KB)

PID 17112: final_project.exe (CPU 7.9%, Mem 32342016 KB)

PID 1936: explorer.exe (CPU 4.8%, Mem 86716416 KB)

PID 15992: Zoom.exe (CPU 4.7%, Mem 33263616 KB)

PID 5096: Discord.exe (CPU 3.1%, Mem 40558592 KB)

PID 16416: Signal.exe (CPU 3.1%, Mem 20946944 KB)

PID 9000: sihost.exe (CPU 1.6%, Mem 11218944 KB)

PID 14280: RuntimeBroker.exe (CPU 1.6%, Mem 6885376 KB)

PID 4492: Zoom.exe (CPU 1.6%, Mem 8577024 KB)

PID 24664: ms-teams.exe (CPU 1.6%, Mem 8056832 KB)

- Settings Screen: Provides theme toggle (light/dark).

Overview   Processes   Settings

Settings

Switch to Light Mode

Refresh interval: fixed at 1s (config coming soon)

3. One Screen with Data, Crates, Background Task

One Screen with Data

- **Overview screen** displays CPU and memory usage.

Crate Selection

Crate	Purpose
iced	GUI framework
sysinfo	System statistics & processes
tokio	Async runtime (used by Iced)
serde	Serialization for config (later)
toml	Config file format (later)

Background Task Integration

- Implemented with time::every(Duration::from_secs(1)).
- Refreshes system data every second in the background.
- Proves integration of background tasks with UI updates.