

Design Doc: Go CLI Tool

Objective

Build a CLI tool in Go that:

- Recursively scans a directory for `.txt` files
- Counts lines in each file
- Computes word frequency across all files
- Outputs the **top 10 most frequent words**

Chosen Approach: Recursive Traversal + Parallel File Processing

- Used Go's built-in `filepath.WalkDir()` for **recursive directory traversal**. It's single-threaded and safe.
- File processing (line counting and word frequency) is handled concurrently using **worker pools** sized to CPU cores, enabling parallelism without overwhelming resources.
- Word counts are aggregated with proper **mutex protection**.
- A **MinHeap** is used to efficiently track the top 10 most frequent words across all files.