

PROJECT ABSTRACT

Disk Analyzer and Cleaner Desktop App

A desktop disk analyzer that visualizes usage with treemaps and largest-folder rankings, finds junk (temp files, caches, logs) by category, and cleans safely — skipping anything that needs human review — built-to-order with source code, report, PPT and viva kit.

01. Title

Disk Analyzer and Cleaner Desktop App

02. Introduction / Background

“Disk full” always arrives at the worst moment — during a project submission or a software install. The built-in OS tools show a single free-space number, which answers nothing about where the space went. This project builds a disk analyzer and cleaner that answers the real questions: which folders are the biggest, what kind of files eat the space, and what can be deleted without risk. A treemap gives the at-a-glance picture, a largest-folders ranking gives the drill-down path, and a categorized junk scanner (temp files, browser caches, logs, thumbnail caches, Recycle Bin) separates safe deletions from items that need the user’s eyes first.

03. Problem Statement

Users cannot act on a bare “X GB free” number, and aggressive cleaners that delete first and ask later cause real data-loss anxiety. Students need a tool that visualizes first, explains each category in plain words, cleans only the unambiguously safe items automatically, and parks everything else in a review queue — with system folders categorically off-limits.

04. Objectives

- Scan a drive and compute per-folder sizes with file counts.
- Render a treemap visualization with click-to-drill-down into folders.
- Rank largest folders with proportional usage bars.
- Implement categorized junk detection: temp files, browser caches, old logs, thumbnail caches, Recycle Bin, update backups.
- Clean selected categories with before/after usage reporting.
- Hold risky categories (Recycle Bin, update backups) in a review queue instead of auto-deleting.
- Never scan or modify system-critical paths.

05. Proposed Methodology

The analyzer performs a bottom-up directory walk, accumulating sizes per folder in a tree structure; the treemap is laid out with a standard squarified tiling algorithm so block areas are proportional to folder sizes. Junk detection uses category rules — known temp/cache paths per OS, file-age thresholds for logs, and Recycle Bin enumeration — each rule documented with what it matches and why it is safe. Cleaning deletes only user-confirmed categories and reports reclaimed bytes per category plus the before/after disk-usage percentage. Categories

flagged as review-needed are listed with plain-language explanations and never touched without explicit approval.

06. System Architecture / Working

Three modules: (1) Analyzer — directory walk, size tree, treemap layout, largest-folder ranking; (2) Junk engine — category rules, per-category size computation, review-queue classification; (3) Cleaner UI — overview dashboard, treemap view, junk checklist, cleaning summary with before/after stats. The working flow is: analyze drive → explore treemap/largest folders → review junk categories → clean selected → verify the recovery summary.

07. Hardware / Software Requirements

- Windows/macOS/Linux desktop or laptop — no special hardware
- Python or Electron with file-system APIs
- Treemap layout implementation; OS APIs for disk-usage stats
- Fully offline; administrator rights only needed for some system cache paths (skipped by default)

08. Expected Outcomes

A working desktop app that visualizes a drive's usage as a treemap, ranks the largest folders, identifies junk by category with byte counts, and cleans the safe categories while holding risky ones for review. Reclaimed-space figures in the demo are illustrative; category-matching rules are exact and documented.

09. Applications

- Freeing disk space before submissions and installs
- Understanding where storage goes on shared lab machines
- Routine PC maintenance for non-technical users
- Coursework demonstration of file systems and visualization

10. Future Scope

- Duplicate-file integration for combined cleanup
- Scheduled weekly scans with notifications
- Large-file finder with age heatmap
- Portable mode for lab machines without install rights