



University
of Windsor

School of Computer Science
<https://cs.uwindsor.ca>

Master of Applied Computing

COMP-8347 Winter 2025

Internet Applications and Distributed Systems

Dr. Saja AL-Mamoori

Final Project Description (20%)

In this major project, your task is to extend the skills you have learned during your lab activities/course lectures to create a web application related to distributed systems using Django framework. The project description, suggested roadmap, and evaluation criteria are as follows:

Distributed File Storage and Retrieval System

Description: This Django app is a system that allows users to upload files, which are distributed across multiple nodes for redundancy and scalability. Users can retrieve files from the nearest or least-loaded node.

Key Features:

- File chunking and distributed storage across nodes (using a backend like MinIO or custom storage).
- Metadata storage in a centralized or semi-centralized Django-based service.
- APIs for file upload, retrieval, and management.
- Implementation of replication, deduplication, and error-checking mechanisms.
- Admin interface for node monitoring and file management.

Roadmap to get started with implementation:

Phase 1: Setup and Core Storage

- Initialize the Django project and set up storage with MinIO or a custom storage solution.
- Implement models to store file metadata (e.g., file size, location, owner).

Phase 2: File Chunking and Distribution

- Develop a file chunking mechanism for large files.
- Create APIs for file upload, chunk distribution, and retrieval.
- Integrate a distributed storage system or simulate nodes locally.

Phase 3: Redundancy and Error Handling

- Add file replication for redundancy.
- Implement error detection (e.g., checksums) and recovery mechanisms.

Phase 4: Retrieval Optimization

- Build logic to retrieve files from the nearest or least-loaded node.
- Add caching for frequently accessed files.

Phase 5: Monitoring and User Interface

- Design an admin panel to monitor file distribution and node statuses.
- Create a user-friendly interface for file uploads and downloads.

Submission, Due Dates, and Marking Criteria

- **Submission:** Via Brightspace. Submit all your project files in ONE .zip folder. This will include a document/user manual stating the guidelines to run your website. An MS Word document should also be uploaded describing your project, the steps you performed to create your website, the role/contribution of each team member (preferably a table or a graph), and the related screenshots. This word document **must not contain** the code.
- **Due Date** = Monday March 24, 2025 (end of day).
- **Presentation/Viva** = A presentation/viva will be conducted during the week of March 24, during regular class time. The schedule will be posted when time approaches.
- **Marks** = 20 points. You will be judged on:
 - Completion of the project
 - Running of your website without errors
 - Satisfaction of the key features
 - Roadmap phases
 - The overall look of your website
 - The documents and files you submit on BB
 - Presentation/viva outcome
 - Each member's individual performance judged during the presentation/viva

Note: Relative marking will be done here. For example, if one of the groups has a brilliant website with all mandatory and several interesting features along with the satisfaction of the above marking conditions, then that group gets the full marks. This group will thus be placed in the “brilliant/excellent” category. Other projects with lesser quality than the brilliant project, will be placed in categories of “very good”, “good”, “average”, and “incomplete”, accordingly. Marks deduction will be done as per the category.