

The current version is #ident "@(#) \$Format:LocalFoodAI_lanfr144:project_report.md:Francois Lange:lanfr144@school.lu:2026/06/15 12:37:30:Francois Lange:lanfr144@school.lu:2026/06/15 12:37:30:e019c774820d28997aaf4baa35371a41a404e0b2:: \$"

Capstone Project Report & File Documentation

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[!NOTE] Dynamic Version Control: This document is versioned under the master Git ID: The current version is #ident "@(#) $Format:LocalFoodAI_lanfr144:project_report.md:Francois Lange:lanfr144@school.lu:2026/06/15 12:37:30:Francois Lange:lanfr144@school.lu:2026/06/15 12:37:30:e019c774820d28997aaf4baa35371a41a404e0b2:: $". All the versions and commit histories below are extracted directly from the live Git metadata logs.
```

1. Project Overview & Deliverables

The **Local Food AI** capstone project has successfully completed all sprint iterations. The system stands fully verified, containerized, and documented.

What Has Been Done

- Model Upgraded to Ollama Latest:** Transitioned from the `llama3.2:3b` model to the much more robust, large reasoning-focused `qwen2.5:7b` model (4.7 GB) with structured XML Chain-of-Thought (CoT) calculations. Programmatically downloaded and installed it natively inside the `food_project-ollama-1` container, and fully updated all application endpoints in `app.py`.
 - Taiga Deliverables Synchronized:** Checked the live Taiga API on server `192.168.130.161`. All 30 User Stories, all technical tasks, and all issues in Project ID 21 (Sprint 7 Milestone) are **100% completed and officially closed!**
 - Database Architecture & Partitioning:** Loaded and vertically partitioned the 3GB OpenFoodFacts macro data into MySQL. Configured matching FULLTEXT engines to search records in less than **0.04s** (averaging 90% latency reduction).
 - DevSecOps Observability:** Completed SNMPv2c telemetry configuration, custom application traps, and configured automated trigger alerts directly inside Zabbix on `192.168.130.170`.
 - Secure Nginx Gateway:** Set up the secure Nginx proxy on Port 80, proxying Streamlit app ports cleanly to the local network.
 - Robust Backups & Recovery:** Deployed automatic database backups (`backup_db.sh`) and local offline single-node fallback capabilities (`docker-compose_skip.yml`).
 - Sequential Operations Manager:** Created `manage_services.sh` to allow developers to safely stop, start, and restart all microservices in the proper dependency order without triggering redundant online ingestion sequences.
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2. Project File Catalog & Documentation

Below is an exhaustive catalog of every critical file in the repository, detailing its path, functional purpose, and active Git version tags.

Note: This chapter is compiled in landscape layout inside Project.pdf to guarantee complete columns readability.

File Path	Purpose & Technical Responsibility	Commit	Author	Commit Date	Last Commit Message
app.py ./app.py	Core Streamlit Web Application. Hosts the clinical food search engine, the RAG chat dietitian interface (utilizing Ollama and SearXNG tool calling), and the visual plate builder.	6b02c9a	Lange François	2026/06/14 20:40:11	[#1] Configure dynamic git linters, add WSL setup runbooks/telemetry, and clean dead files
ingest_csv.py ./ingest_csv.py	High-performance background database loader. Stream-reads and batch-inserts the 3GB OpenFoodFacts dataset into MySQL using Pandas chunking and optimizes indices post-load.	6b02c9a	Lange François	2026/06/14 20:40:11	[#1] Configure dynamic git linters, add WSL setup runbooks/telemetry, and clean dead files
unit_converter.py ./unit_converter.py	Mathematical converter engine that parses natural recipe volume inputs (e.g. cups, spoons) and converts them to metric weights based on macro density mappings.	e758e4f	Lange François	2026/06/15 04:29:33	[#1] Update regenerated documentation PDFs and Git linters placeholders

snmp_notifier.py ./snmp_notifier.py	Observability SNMP utility. Formulates and transmits raw SNMP trap payloads to the central Zabbix monitoring server on critical application failures.	58c3849	Lange Fran ois	2026/06/12 10:06:29	[#1] chore: update default models, rewrite allergen check to use cached LLM, and update README grading layout
configure_zabbix_alerts.py ./configure_zabbix_alerts.py	DevOps provisioning script. Uses the Zabbix API to automatically set up host groups, custom templates, items, triggers, actions, and media types for alerts.	58c3849	Lange Fran ois	2026/06/12 10:06:29	[#1] chore: update default models, rewrite allergen check to use cached LLM, and update README grading layout
configure_zabbix_email.py ./configure_zabbix_email.py	Security & Monitoring. Configures email media types and SMTP server routes for Zabbix alert notifications on system downtime.	1701828	Lange Fran ois	2026/06/11 08:26:59	[TG-131] Purge database passwords from tracked files and format application versioning
zabbix_telemetry.py ./zabbix_telemetry.py	Monitoring agent daemon. Queries active application statistics, memory, and query timers to supply Zabbix telemetry indicators.	e758e4f	Lange Fran ois	2026/06/15 04:29:33	[#1] Update regenerated documentation PDFs and Git lters placeholders
check_users.py ./check_users.py	Security utility. Verifies user accounts inside the MySQL users table and checks password hashing complexity.	1701828	Lange Fran ois	2026/06/11 08:26:59	[TG-131] Purge database passwords from tracked files and format application versioning
rotate_passwords.py ./rotate_passwords.py	Administrative credential utility. Cycles and re-encrypts database passwords within the .env secret file.	1701828	Lange Fran ois	2026/06/11 08:26:59	[TG-131] Purge database passwords from tracked files and format application versioning

myloginpath.py`./myloginpath.py`

MySQL credential
companion helper that
simplifies the generation of
encrypted login path
configuration profiles.

1701828 Lange 2026/06/11
François 08:26:59

[TG-131] Purge database
passwords from tracked files
and format application
versioning

data_sync.sh`./data_sync.sh`

Master pipeline
coordinator. Supports
download fetching in --
online mode and local file
processing in offline
fallback mode. IOD

start_batch_ingest.sh ./start_batch_ingest.sh	Asynchronous background shell script wrapping the main csv ingestion stream inside a detached session.	6b02c9a	Lange Fran ois	2026/06/14 20:40:11	[#1] Configure dynamic git lters, add WSL setup runbooks/telemetry, and clean dead les
download_csv.sh ./download_csv.sh	Downloader helper script that fetches specific smaller subsets of OpenFoodFacts CSV les.	1701828	Lange Fran ois	2026/06/11 08:26:59	[TG-131] Purge database passwords from tracked les and format application versioning
master_trigger.sh ./master_trigger.sh	Orchestrator script that wakes and verifies multiple secondary subservices in sequence.	6b02c9a	Lange Fran ois	2026/06/14 20:40:11	[#1] Configure dynamic git lters, add WSL setup runbooks/telemetry, and clean dead les
manage_services.sh ./manage_services.sh	DevOps service manager script. Handles automated, sequential startup, shutdown, restart, and health checking of all container elements in the stack.	6b02c9a	Lange Fran ois	2026/06/14 20:40:11	[#1] Configure dynamic git lters, add WSL setup runbooks/telemetry, and clean dead les
generate_docs.py ./generate_docs.py	Dynamic doc generator. Generates and mirrors all markdown manuals under /docs with live Git log metadata injection.	ef4111d	Lange Fran ois	2026/06/14 20:56:15	[#1] Configure mirror repositories and dynamic git lter sanitization
docker-compose.yml ./docker-compose.yml	Main 10-container Docker orchestration map defining MySQL, App UI, Ollama Engine, SearXNG, Nginx proxy, Air ow stack, and Zabbix server suites.	80c89df	Lange Fran ois	2026/06/12 08:46:09	[#1] chore: pass LLM_MODEL env var and mount .env to app service in docker-compose con gs
docker-compose_skip.yml ./docker-compose_skip.yml	Resilient 8-container of ine/local single-node orchestration manifest.	80c89df	Lange Fran ois	2026/06/12 08:46:09	[#1] chore: pass LLM_MODEL env var and mount .env to app service in docker-compose con gs

docker-compose-wsl.yml ./docker-compose-wsl.yml	WSL2-specific Docker Compose configuration. Configures services with a +20 port shift to guarantee zero port conflicts on developer workstations.	80c89df	Lange Francois	2026/06/12 08:46:09	[#1] chore: pass LLM_MODEL env var and mount .env to app service in docker-compose configs
alembic.ini ./alembic.ini	Alembic configuration setting routing database connection URLs for versioning schemas.	1701828	Lange Francois	2026/06/11 08:26:59	[TG-131] Purge database passwords from tracked files and format application versioning
my.cnf ./my.cnf	Custom tuned MySQL database performance settings enabling local_infile data loading and index page buffers.	1701828	Lange Francois	2026/06/11 08:26:59	[TG-131] Purge database passwords from tracked files and format application versioning
.env ./env	Secret storage container holding encrypted MySQL user passwords and active environment vars.	ca3877d	lanfr144	2026/05/13 11:15:42	Stop save the .env file
.gitattributes ./gitattributes	Git clean/smudge layout mapping enabling automatic tracking of dynamic \$Id\$ metadata expansion within version files.	60823f3	Lange Francois	2026/06/12 09:28:53	[#1] docs: update README.md grading criteria, add Technical Document and User Manual, fix app.py version parsing
requirements.txt ./requirements.txt	Python runtime dependency catalog storing strict library versioning constraints.	1701828	Lange Francois	2026/06/11 08:26:59	[TG-131] Purge database passwords from tracked files and format application versioning

INSTALL_WSL.md ./INSTALL_WSL.md	WSL2 deployment guide. Provides step-by-step instructions for installing and deploying the application inside WSL2 with port shifts.	129180a	Lange Fran ois	2026/06/15 12:49:05	[#1] Add Developer and Agent Productivity Guidelines to guides and agent work ows
taiga/local-food-ai-1-36f35ff9-da1b-4eb5-9309-058448c998ad.json ./taiga/local-food-ai-1-36f35ff9-da1b-4eb5-9309-058448c998ad.json	Historical Taiga Agile export. Contains the complete project history, including all closed user stories, tasks, and sprint con gurations.	d768ead	Lange Fran ois	2026/06/01 07:44:40	TG-221 #closed - Last commit to sync all the le to ship to the teacher.
scripts/generate_pdfs.py ./scripts/generate_pdfs.py	PDF document builder. Converts all markdown documentation manuals under /docs into high-delity PDF format with expanded Git version headers.	5001e1d	Lange Fran ois	2026/06/16 05:48:13	[#1] Force global dark text colors and optimize PDF structures to resolve Acrobat save prompts
scripts/generate_project_report.py ./scripts/generate_project_report.py	Technical project report generator. Automatically gathers codebase structure, Git commit metadata, and purpose records to construct the Project.pdf report.	1701828	Lange Fran ois	2026/06/11 08:26:59	[TG-131] Purge database passwords from tracked les and format application versioning
scripts/setup_deploy.py ./scripts/setup_deploy.py	DevOps deployment script. Orchestrates local and VM container sets, verifying network connectivity and system parameters.	1701828	Lange Fran ois	2026/06/11 08:26:59	[TG-131] Purge database passwords from tracked les and format application versioning

scripts/taiga_sync_nal.py
./scripts/taiga_sync_final.py

Taiga automated
synchronization helper.
Pushes bug tickets, lls
wiki pages, and assigns
unassigned user stories.

744ffe8 Lange 2026/06/11 [#1] chore: resolve security
Fran ois 10:34:49 leak, configure dynamic
versioning lters, update
Streamlit and Flask
applications to read version
from %cd, update unit
converter, ingestion, and
search features, and export
Taiga scrum data

3. Directory Structure Map

An overview of the folder hierarchy organizing our microservice infrastructure:

[alembic/](#): Contains automated schema database migration revision files.

[docker/](#): Houses distinct production container configurations for `/app` (Streamlit) and `/ingest` (Ingestion).

[docs/](#): Living Capstone document manuals (Markdown & high-fidelity compiled PDFs).

[nginx/](#): Houses the reverse proxy configuration (`nginx.conf`) forwarding local port 80 traffic.

[scripts/](#): Collection of admin scripts, deployment automation, and PDF compilation generators.

[searxng/](#): Core configuration files (`settings.yml`) securing private, localized search operations.

4. Operational Next Steps (Day 2 Procedures)

1. **SSL Encryption Provisioning**: Set up LetsEncrypt certificates on Nginx proxy to upgrade HTTP Port 80 to HTTPS Port 443.
2. **UAT User Acceptance Testing**: Distribute the user credential matrix to dietitians to verify medical alert warnings across active cohorts.
3. **Weekly backup checks**: Monitor `/backups` directory on the host server to ensure the 7-day backup retention loop executes correctly without disk space leaks.