

PROJECT BRIEF – Web Interview Recorder (Per-Question Upload) — Full Terms

Audience: Team of 4 students

Duration: 5 weeks

Environment: Web (Frontend and Backend), runs on localhost; Hypertext Transfer Protocol Secure (HTTPS) is required if public

1) Learning Objectives

- Use `MediaDevices.getUserMedia` to request camera/microphone access; record one video per question.
- Design a sequential User Interface (UI) for interviews (≤ 5 questions); use a Next button to end the current question and proceed.
- Upload immediately after each question (per-question upload); manage the session via Application Programming Interface (API) endpoints: `verify-token`, `session/start`, `upload-one`, `session/finish`.
- Organize server storage as: `DD_MM_YYYY_HH_mm_ten_user/` (timezone: Asia/Bangkok) with metadata.
- (Bonus) Per-question Speech-to-Text (STT) to produce `transcript.txt`.

1.x) Connection to Computer Networking (simple explanation)

- This is a client–server exercise: the browser (client) sends data to the server over Hypertext Transfer Protocol (HTTP) or Hypertext Transfer Protocol Secure (HTTPS).
- You will create a few simple Application Programming Interfaces (APIs) — `start session`, `upload each question`, `finish` — so both sides communicate correctly.
- The browser enables camera/microphone and sends each question’s video to the server (similar to uploading files over a network).
- The system must handle network errors (loss, retries with backoff) to avoid data loss.
- The server names folders by time and keeps logs for verification and grading.

2) Problem Description

Candidate opens the link, enters Token and Name, and grants camera/microphone permissions. The app shows up to five questions sequentially; each question is recorded as a separate file. When Next is pressed, recording stops and that question's video is uploaded immediately. Press Finish to close the session. The server stores files under DD_MM_YYYY_HH_mm_ten_user/ with metadata; (Bonus) generate transcript.txt per question.

3) Scope and Constraints (mandatory)

- Maximum five questions; display one question at a time.
- Per-question upload: stop recording question $i \rightarrow$ upload immediately; proceed to $i+1$ only after successful upload (or with a clear retry/backoff policy).
- Session flow: session/start \rightarrow upload-one (each question) \rightarrow session/finish.
- Token validated on the server; client-side checks are advisory only.
- Sanitize candidate name to create a filesystem-safe folder name.
- Server structure: DD_MM_YYYY_HH_mm_ten_user/ with Q1.webm..., metadata (for example, meta.json), and (Bonus) transcript.txt.
- State size limits and accepted Multipurpose Internet Mail Extensions (MIME) types clearly in the README.
- HTTPS is required when deployed publicly to access camera/microphone.

4) Functional Requirements

- Start: Enter Token and Name \rightarrow verify-token \rightarrow request camera/microphone.
- Interview: preview, current question, Next (stop and upload), Finish (end session; no more uploads).
- Per-question upload: call upload-one (multipart/form-data) with token, folder, questionIndex, and video; show status (uploading/success/retry).
- Finish: call session/finish with questionsCount to finalize metadata.

5) API Contract (description – no code)

- POST /api/verify-token → Body { token } → { ok: true } or status 401.
- POST /api/session/start → Body { token, userName } → { ok: true, folder: "DD_MM_YYYY_HH_mm_ten_user" }.
- POST /api/upload-one (multipart/form-data, per question) → Fields: token, folder, questionIndex, video → { ok: true, savedAs: "Q<index>.webm" }.
- POST /api/session/finish → Body { token, folder, questionsCount } → { ok: true }.
- Notes: Create the folder at session/start; update metadata incrementally after each upload-one.

6) User Experience (UX), Errors and Safety

- Clear statuses: permission, recording, stopped, uploading, retry, done.
- Errors: invalid token, permission denied, network/size/MIME errors, missing fields → helpful messages with guidance.
- Retry with exponential backoff at least two to three times; provide a manual Retry button.
- Security decisions on the server; logs with ISO 8601 timestamps, timezone Asia/Bangkok.

7) Allowed Creativity (optional)

- Custom question set (\leq five), per-question timer, one-time re-record per question (define file naming rules).
- Progress bar, size warnings, per-question upload progress, remux/transcode after upload, webhook/email on Finish.
- (Bonus) Speech-to-Text (STT): choose engine, trigger timing, transcript.txt format labeled per question.

8) Acceptance Criteria

- Start: only a valid token proceeds to interview.
- Each question: show → record → Next → Q*.webm appears immediately on the server.
- Folder name matches DD_MM_YYYY_HH_mm_ten_user/ (timezone Asia/Bangkok).

- Metadata includes at least userName, uploadedAt (ISO 8601), timeZone, and list of received questions.
- Finish closes the session; no extra uploads.
- (Bonus) transcript.txt exists with per-question sections.

9) Deliverables

- Shared Git repository (all four students contribute).
- README: architecture and flow; API contract; run instructions; HTTPS requirement; file limits and retry policy; folder/file naming; (Bonus) Speech-to-Text.
- Screenshots: Start, recording, per-question upload status, server folder after each question, (Bonus) transcript.
- Demo video ≤ three minutes: demonstrate two to three questions end-to-end.
- PDF report (five–seven pages): objectives, design, security, testing, risks and mitigations, limitations and future work.
- Task allocation sheet: roles, contribution ratios, Pull Request (PR) and issue links as evidence.

10) Grading (100 points)

- Functionality (60): token and server-side validation (10); sequential and per-question recording (20); per-question upload with status and retry (20); storage and metadata (10).
- Technical and documentation (25): architecture, API, README/report (10); code quality, testing, Git workflow (10); basic UX and error messages (5).
- Bonus (15): per-question Speech-to-Text → transcript.txt (10); automated pipeline (5).

11) Five-Week Plan (suggested)

- Week 1 – Inception and Architecture: confirm core rules, flow, API contract, plan and repository.
- Week 2 – Core Frontend: per-question recording, state management, local prototype.

- Week 3 – Backend and Upload: session/start, upload-one, metadata, Frontend↔Backend integration, end-to-end for two to three questions.
- Week 4 – Reliability and UX: retry/backoff, file limits, UX polish, README v2 and screenshots.
- Week 5 – Bonus and Packaging: Speech-to-Text (optional), cross-browser tests, acceptance run, demo video, report, allocation sheet.

12) Academic Integrity

- All references must be cited; no turn-key templates. Plagiarism results in zero points.

13) Self-Check Questions (include in report)

- Why must the token be validated on the server?
- What are the benefits of per-question recording and upload?
- Why is HTTPS required publicly for camera/microphone permissions?
- How do you design retry/backoff and decide when to allow moving to the next question?
- (Bonus) Which Speech-to-Text engine and why? Accuracy/performance/cost trade-offs; per-question labeling.