

# Final Project

**Due Dates:** There will be multiple submissions and due dates vary. See [Due Dates & Submissions Milestones](#) section in this document for details.

**Grading Note:** For this final project, we will use the 100-point grading system. Each team will be graded on a 100-point scale, and the grade will be converted proportionally to a **20-point scale** and recorded in the gradebook. For example, a 70/100 grade will be  $20 * (70 / 100) = 14$  points in your gradebook.

## Requirement

### Web App (30')

You will work with a group of 3-4 students to build a cloud-based web application on AWS. You can build any kind of web app you would like. Minimum requirements for the web app:

- (10') At least 2 pages. JavaScript is required because you will need to use the JS to call the API.
- (10') At least 1 API to connect the data between your front-end pages and the database.
- (10') At least 1 database. It's recommended to use AWS RDS.

Some ideas I have in mind for your reference:

- A simple note taking app where the user can create public text notes. Other users can like or dislike the notes. And the number of likes and dislikes are displayed on the list.
- A news aggregator where the users can see a list of news titles with a link to the source website. Users can like or dislike the notes. And the number of likes and dislikes for each news item are displayed on the list.

### Cloud Architecture (40')

You are free to design your cloud architecture. Some minimum requirements include:

- (10') Use Ubuntu EC2 instances to host your web app.
- (10') Create your own VPC (not the default one). Create at least 1 public subnet.
- (10') Deploy the EC2 instances across multiple AZs in the N.Virginia region. Deploy them to the public subnet.
- (10') Setup Auto Scaling Group and Load Balancer to make your web app scalable.
- **(Bonus +10)** Register a public domain (or use the one you already have) and use Route 53. The ultimate goal is to have the user access your web app through your domain. Note: An annual registration fee would apply for your domain. **I highly recommend you to purchase the domain privacy protection service**, so your home address and phone numbers are not visible to everyone around the world (including hackers).

## Scrum (10')

- Each team will use Scrum Agile methodology to manage this final project. Board has already been set up on Trello, and shared with each team member.
- We use a 1-week sprint. So the total will be 5 sprints.
- Split the whole project into smaller requirements. Each requirement is placed into a card on your board, and we call it a "ticket".
- One of the team members will be a Scrum Master. Before the sprint starts, we will have a planning session in class. Each team will pull tickets into the upcoming sprints, and assign a story point to each ticket. During this meeting, we will also assign each ticket of the upcoming sprint to a team member.
- During the sprint, team members work on the tickets and move them across the board accordingly. The Scrum Master will run the check-in meetings with the team every few days. They will also note which tickets are blocked, and work with the team to find a solution to unblock these tickets.
- At the end of the sprint, Scrum Master will host an **End of sprint review** meeting in class, where you check the status of each ticket in the current sprint, if there's any tickets to carry over to the next sprint, etc. Then, there will be a **retro meeting** for team members to discuss what went well, what needs improvement, and what needs to change for the next sprint.

Point Breakdown:

- Milestone 4 - 8: 2' each.

## Team Work (10')

Every team member has to make contributions on the code and build the cloud services. **No one should be dedicated to administrative work (such as Scrum master).**

It's the team's responsibility to ensure the work is distributed evenly across team members.

Point breakdown:

- Milestone 2: 5'
- Milestone 3: 5'

## Idea Generation (10')

Point Breakdown:

- Milestone 1: 10'

# Due Dates & Submissions Milestones

## Milestone 1: Idea Presentation - **Individual** (Due before Module 8 Lecture)

### Part 1

Each student will write the idea in a Word document or a Google Doc. The minimum requirement is to include the following sections.

Section 1: Briefly introduce what kind of web app you would like to build.

Section 2: Main features of the web app.

Section 3: An architecture diagram for the cloud setup.

### **Submission:**

- **The Word document, or a copy of your Google Doc link.**
- **Slides for your presentation.**

### Part 2 (In-class)

Each student presents your idea in class.

Vote for your favorite idea.

Form groups.

**Rubrics:** 10' total for Milestone 1. **Everyone** must submit it independently.

## Milestone 2: Team Agreement (Module 8 In-class Activity)

Download the "Team Agreement Template" from Canvas. The file is placed under the Assignments -> Group Final Project.

Each team will get together and fill out the team agreement together.

**Rubrics:** 5' total for Milestone 2.

**Submission:** **One member of the team** will submit the file to Canvas by the end of the class.

## Milestone 3: Architecture Diagram & Scrum Board Setup

Discuss the initial cloud architecture design with your teammates. Edit and finalize the architecture design diagram.

Create a scrum board on Trello.com and invite your teammates and your instructor (Trello Email: [yuz.chen@northeastern.edu](mailto:yuz.chen@northeastern.edu)) to the board.

**Rubrics:** 5' total for Milestone 3.

- (2') Your architecture diagram must be made with software such as LucidChart, Figma, PowerPoint, etc.
- (2') Each ticket needs to include a description.
- (1') The tickets that should be done first shall be placed on top of the Backlog list. The last-do tickets are placed at the bottom of the Backlog.

**Submission: One member of the team** will submit the diagram and the link to Trello board to Canvas by deadline.

#### Milestone 4: Sprint 1 Planning (Module 9 in-class activity, no submissions on Canvas)

I will work with each team in class to do a planning session. In this session, we will give each ticket a story point (1, 2, 3, 5, 8). Then we will pull the tickets from the backlog into the Sprint 1 Column, based on our estimation of how much the team can achieve in the next 2 weeks.

Once we finish the planning session, Sprint 1 will start.

**Rubrics:** 2' total for Milestone 4.

#### Milestone 5: Close Sprint 1, Sprint 2 Planning (Module 10 In-class activity, no submissions on Canvas)

I will work with each team in class to run the end of the sprint meeting, and the retrospective meeting.

**Rubrics:** 2' total for Milestone 5.

#### Milestone 6: Close Sprint 2, Sprint 3 Planning (Module 11 In-class activity, no submissions on Canvas)

This time, the Scrum Master of each team will run the end of the sprint meeting, and the retrospective meeting for Sprint 2, and planning session for Sprint 3. Once we finish the planning session, Sprint 3 will start.

**Rubrics:** 2' total for Milestone 6.

#### Milestone 7: Close Sprint 3, Sprint 4 Planning (Module 12 In-class activity, no submissions on Canvas)

**Rubrics:** 2' total for Milestone 7.

Milestone 8: Close Sprint 4, Sprint 5 Planning (Module 13 In-class activity, no submissions on Canvas)

**Rubrics:** 2' total for Milestone 8.

Milestone 9: Presentation & Project Submission (Due before Module 14 Lecture)

Each team will make a slide to show the overall timeline, features the team has done, architecture diagram, any difficulties you encountered & how you overcame them, lessons learned, etc. Then you will walk through your cloud setups on AWS, demo the web app. All members will present it in our last lecture.

**Submission:**

On Canvas, **only one member** in each team will submit the slides for the presentation, and the link to your Github repo (if any).

**Rubrics:** 70' total for Milestone 9.

- See [Requirement section](#) for details. 70' covers the [Web App](#) (30') and [Cloud Architecture](#) (40')