

CS482/495/496 Software Project Proposal: add your tentative project title here

Nate Barton, Joe Fielding, Kyle Richards, Vilnis Jatnieks

2025-10-26

1 Client Information

By sharing this client information and the rest of this document, you are stating that this client has provided this project as something they want (not something you created and asked if they wanted), and that they are interested in having you complete this project for your capstone.

- Client name: Dr. Isaacman
- Client title: Department Chair, Associate Professor
- Client email address: snisaacman@loyola.edu
- Client employer: Loyola University Maryland
- How you know the client: CS department

2 Project Description

2.1 Overview

The League of United Minors (LUM) youth football league website will provide a space for community interaction, assist coaches and players in roster management and team sign-up, and display real time data including live games, standings, and league-approved social media posts.

2.2 Key Features

[At this point you should have a basic understanding of your client's needs. List out the key features of the software system the client wants you to build.]

2.3 Why this Project is Interesting

[Why did you decide this project was interesting enough to you to be a capstone project? What about this project is enticing? Why should anyone care?]

2.4 Areas of CS required

[What subfields of computer science seem most likely to be relevant to your project? A capstone must involve multiple.]

2.5 Potential Concerns and Questions

[Is there any aspect of this project that makes you unsure if it will work, either due to your own interests/background, or that you aren't sure if it fits the requirements? Are there questions you have about this project that you want instructor feedback about?]

2.6 Summary of Efforts to Find a Project

(Not necessary for 482) [Briefly list out when/how you’ve discussed with this client, and if you’ve discussed with other clients who either didn’t work out or didn’t respond. If you considered a different project and it didn’t work out, why didn’t it work out?]

[Most CS495 projects end here. The sections below are for CS482 and CS496 software projects].

2.7 Comparison to Draft

[For CS496 only, focus on highlighting the major differences between the draft proposal in CS495 and this one here. If there are no major differences, you can remove this subsection.]

3 Requirements

3.1 Non-Functional Requirements

[Non-functional requirements are just as important as functional requirements. Dont forget to specify them.]

ID	NFR Title	Category	Description
NFR1	NFR Example 1	Usability	Description of the NFR (it does not follow a user story template)
NFR2	NFR Example 2	Security	Description of the NFR (it does not follow a user story template)

Table 1: Non-Functional requirements

3.2 Functional Requirements (User Stories)

[In CS482, all functional requirements are written as User Stories. In CS496, some projects may use a different template to write the requirements. The table below is an example of writing the Stories. Adapt accordingly to different templates or if you want to display more info.]

ID	Story Title	Points	Description
S1	Story Example 1	5	As a user, I want to write a user story example, so that people will understand them.
S2	Story Example 2	2	As a user, I want to write a user story example, so that people will understand them.

Table 2: Functional requirements as User Stories.

4 System Design

4.1 Architecture

We are using the Web MVC architecture. The main modules for our software are the view, model, and controller. The view will be the several HTML files for each page of our website. When the client goes to the website in their browser, it will send a request to our backend. The controller will be responsible for selecting the appropriate HTML file which will then be sent back to the client. The model will handle all the CRUD operations for our database where we will have tables for all our required entities for our application such as users, teams, and posts. The controller is also responsible for being in the middle of the client’s interaction. To show how the three main modules fully interact with each other, here is an example flow of an admin creating a match. The admin interacts with the view on the front end to create a new match. This then

sends a request to the backend, and the controller handles this request. The controller will communicate with the model that the match needs to be added, and the model will add the match to the database.

4.2 Diagrams

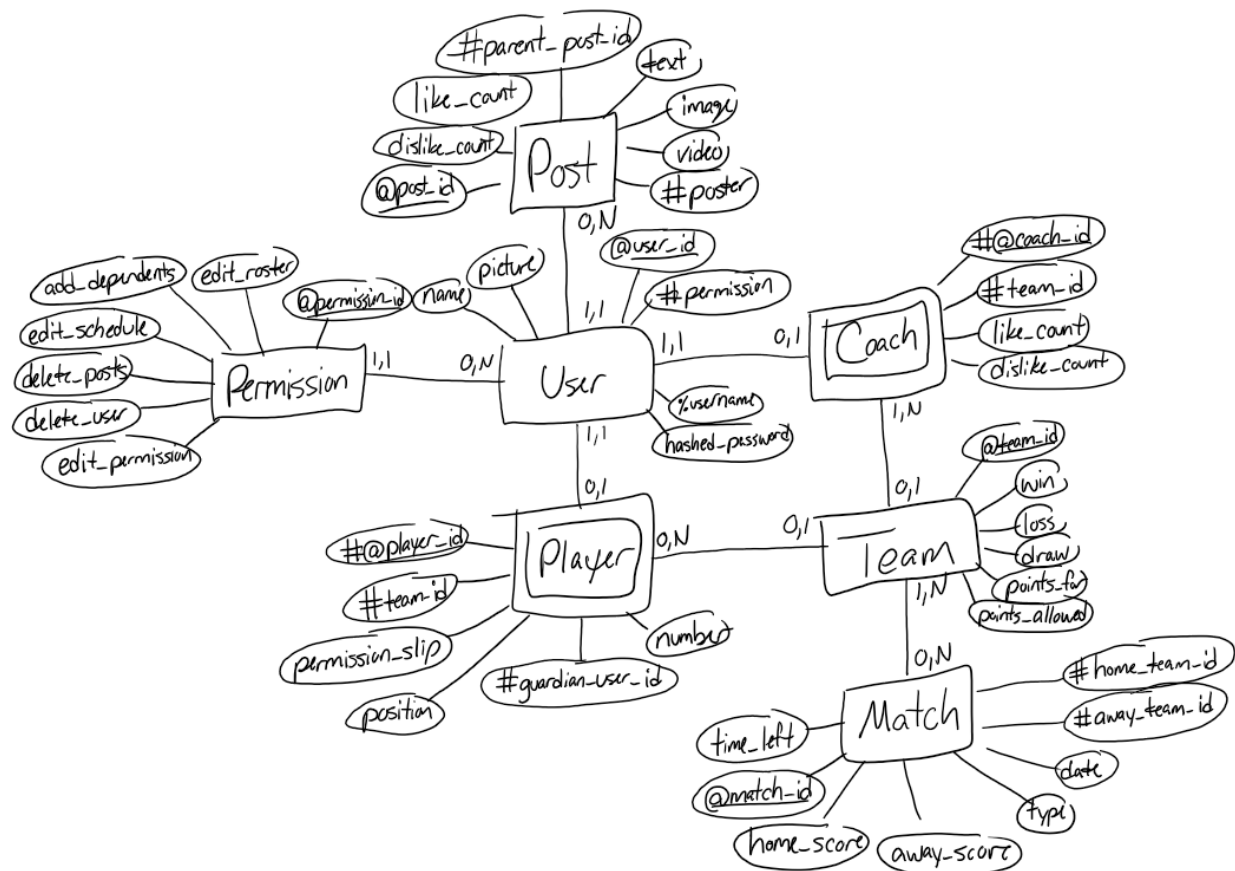
4.3 Technology

We will be using the Kotlin programming language on the backend. The main framework we will be using to make our web application is Spring. We will also be using JUnit 5 as our unit testing framework for backend, and vitest for frontend testing. We will use React for the frontend, an Mantine for styling and UI components. For the database, we will be using a relational database Postgres SQL.

4.4 Coding Standards

We will use the typical naming conventions in kotlin/java, with class names being Pascal case and variable and method names being camel case. In the database, collection names will be Pascal Case and attribute names snake case. Additionally, only code with at least 80% unit test coverage can be committed.

4.5 Data



4.6 UI Mocks

User

Login/
Profile

League of United Miners

Username

Password

Login Sign up

set profile image

Name

Email

Phone

Your dependents Add

Timmy 8/18/12 Remove

This is a
minimizeable
side bar.

Dashboard/
Post

League

Home

Teams

Schedule

See what's new

I'm posting! Hello, this is a post! 50%

My post is better... That other guy's post isn't as good as mine. 25%

Birds highlight Check this out! 100%

I'm posting! Hello, this is a post! 50%

I think your post is bad. 10%

His post is great! 90%

Team view

Teams

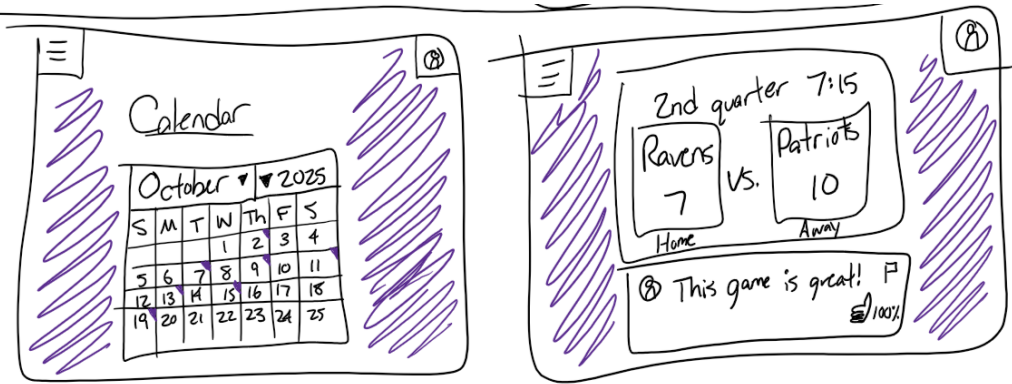
Rank	Team	W	L	D
1	Ravens	3	0	0
2	Eagles	1	1	1
3	Giants	1	2	0
4	Patriots	0	2	1

Ravens

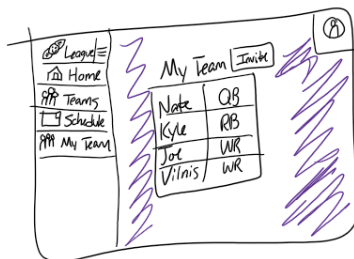
Coach Gary 100%

Nate	QB
Kyle	RB
Joe	WR
Vilnis	WR

Event view

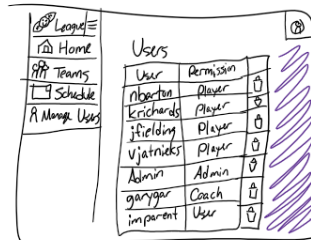


Coach

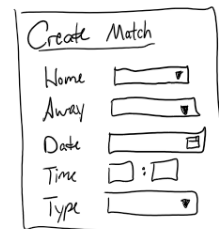


Players also have the "My Team" tab, but are unable to invite players.

Admin



Match creation modal



The admin has "Create" on Schedule page
The admin also has an "Edit" button on Teams page
Also, every comment has (delete).

5 Iterations

5.1 Iteration Planning

[In CS496, you plan all iterations beforehand. In CS482, you update the planning here at each iteration.]

Iteration	Dates	Stories	Points
1	01/01 - 02/01	A1 Admin manage user, C17 Coach edit roster, A2 Admin create schedule, A25 Admin edit schedule, C3 Coach create team, C16 Coach invite team members, U4 User view team record, G23 Guardian approve child invite	23
2	02/01 - 03/01	S3 Story Title, S4 Story Title, S5 Story Title, S6 Story Title	17
3	03/01 - 04/01	S7 Story Title, S8 Story Title, S9 Story Title, S10 Story Title, S11 Story Title	21
4	04/01 - 05/01	S12 Story Title, S13 Story Title, S14 Story Title, S15 Story Title	19
5	05/01 - 06/01	S16 Story Title, S17 Story Title	06
Total:			70

Table 3: Iteration Planning for Incremental Deliveries

5.2 Iteration/Sprint 1

5.2.1 Planning

We planned to complete:

- coaches create team
- coaches editing the roster
- coach invite team members
- user crud
- admin create schedule
- admin edit schedule
- user view team record
- guardian approve child

Overall this is 23 points

Joe - 6 pts Nate - 6 pts Kyle - 6 pts Vilnis - 5 pts

5.2.2 Work Done

We completed all of the stories that we planned. Each task was delegated as stated in the email detailing who would do each task. The only thing that we did not do is design UI functionality for some of the stories. Despite this, all of the functionality is already there, so we simply need to just add buttons that call that logic.

5.2.3 Testing Coverage

We have high coverage for this iteration and made sure to make unit tests for all the frontend and backend pieces. For the backend, we used Spring's testing framework, which is built off of JUnit. The frontend testing framework we use is vitest. Below are images of the frontend and backend coverage reports at the top level. The full reports are both committed to the GitHub repository.

File	Statements	Branches	Functions	Lines
components/layout	100%	5/5	100%	5/5
components/login	100%	10/10	100%	10/10
components/schedule	94.11%	64/68	87.5%	59/63
components/signup	93.75%	15/16	60%	15/16
components/teams	100%	7/7	100%	7/7
request	85.71%	18/21	0/0	18/21
types	100%	10/10	75%	9/9

Figure 1: Frontend Coverage

Current scope: all classes				
Overall Coverage Summary				
Package	Class, %	Method, %	Branch, %	Line, %
all classes	100% (57/57)	97.3% (180/185)	57.3% (63/110)	95.6% (647/677)
Coverage Breakdown				
Package	Class, %	Method, %	Branch, %	Line, %
com.jkxv.lum	100% (2/2)	66.7% (2/3)		50% (2/4)
com.jkxv.lum.config.seed	100% (7/7)	100% (18/18)	50% (7/14)	100% (95/95)
com.jkxv.lum.controller	100% (4/4)	100% (22/22)	50% (1/2)	100% (51/51)
com.jkxv.lum.model.dto	100% (10/10)	100% (10/10)		100% (45/45)
com.jkxv.lum.model.entity	100% (9/9)	94.3% (33/35)	75% (3/4)	96.7% (145/150)
com.jkxv.lum.model.request.account	100% (3/3)	100% (4/4)		100% (18/18)
com.jkxv.lum.model.request.match	100% (2/2)	100% (3/3)		100% (29/30)
com.jkxv.lum.model.request.player	100% (2/2)	100% (2/2)		100% (4/4)
com.jkxv.lum.model.request.team	100% (1/1)	100% (2/2)		100% (13/13)
com.jkxv.lum.model.type	100% (3/3)	100% (3/3)		100% (9/9)
com.jkxv.lum.security	100% (3/3)	87.5% (14/16)	80% (8/10)	96.5% (55/57)
com.jkxv.lum.services	100% (11/11)	100% (67/67)	55% (44/80)	90% (190/211)

Figure 2: Backend Coverage

5.2.4 Retroespective & Reflection

Overall, much of the pitfalls came from the growing pains of learning a new set of technologies. We got the Spring and React frameworks set up. Then we had to figure out the spring and react way of doing things. Though after that, it became much easier to add more. We also did a bit of refactoring, which may have stunted a bit of our progress. This was mainly done because we really wanted to make sure we had a rigid API and proper design, so that in the future iterations we could handle new tasks gracefully. We also perhaps focused too much on security for the login, since we ended up implementing a Jwt system for authentication. Since we have the backbone done and a decent chunk of UI done, we should be able to handle the coming iterations better, so that we can focus more on the features that are necessary. Overall though, we feel that we made decent progress for this iteration, and are ready to make much more for next iteration.

5.3 Iteration/Sprint 2

5.3.1 Planning

[Which stories did you plan for this iteration/sprint. Add the total points for this plan. You can also explain the reason behind your planning, and what major feature(s) your team is focusing on delivering by completing these stories. You may use a table for a summary display of the planning, but elaborate in text more detail in your focus and feature plan.]

5.3.2 Work Done

[Which stories did you complete in this iteration/sprint. Which ones did you partially complete? Who worked on which story? You may elaborate in paragraph(s) to add more detail about the work done.]

5.3.3 Testing Coverage

[Testing is very important. Show your coverage here. Is this coverage good enough? Explain why you think so. Is it not good enough? Explain a plan to increase the coverage. You may also elaborate on why some artifacts do not undergo much testing. If the testing changed from the last iteration, explain the reasons.]

5.3.4 Retroerspective & Reflection

[What were the pitfalls, challenges, and issues you had in this iteration? How can you address them to improve the process in the next iteration? Did anything not go according to plan? Why so and how to avoid the same mistake? Write a personal reflection on what you learned in this iteration (even if a small technical thing like Database storage).]

5.4 Iteration/Sprint 3

5.4.1 Planning

[Which stories did you plan for this iteration/sprint. Add the total points for this plan. You can also explain the reason behind your planning, and what major feature(s) your team is focusing on delivering by completing these stories. You may use a table for a summary display of the planning, but elaborate in text more detail in your focus and feature plan.]

5.4.2 Work Done

[Which stories did you complete in this iteration/sprint. Which ones did you partially complete? Who worked on which story? You may elaborate in paragraph(s) to add more detail about the work done.]

5.4.3 Testing Coverage

[Testing is very important. Show your coverage here. Is this coverage good enough? Explain why you think so. Is it not good enough? Explain a plan to increase the coverage. You may also elaborate on why some artifacts do not undergo much testing. If the testing changed from the last iteration, explain the reasons.]

5.4.4 Retroerspective & Reflection

[What were the pitfalls, challenges, and issues you had in this iteration? How can you address them to improve the process in the next iteration? Did anything not go according to plan? Why so and how to avoid the same mistake? Write a personal reflection on what you learned in this iteration (even if a small technical thing like Database storage).]

5.5 Iteration/Sprint 4

[CS496 has 5 sprints. CS482 only has only 3 sprints (remove Iterations 4 and 5 from this doc if you are writing a doc for 482)]

5.5.1 Planning

[Which stories did you plan for this iteration/sprint. Add the total points for this plan. You can also explain the reason behind your planning, and what major feature(s) your team is focusing on delivering by completing these stories. You may use a table for a summary display of the planning, but elaborate in text more detail in your focus and feature plan.]

5.5.2 Work Done

[Which stories did you complete in this iteration/sprint. Which ones did you partially complete? Who worked on which story? You may elaborate in paragraph(s) to add more detail about the work done.]

5.5.3 Testing Coverage

[Testing is very important. Show your coverage here. Is this coverage good enough? Explain why you think so. Is it not good enough? Explain a plan to increase the coverage. You may also elaborate on why some artifacts do not undergo much testing. If the testing changed from the last iteration, explain the reasons.]

5.5.4 Retropective & Reflection

[What were the pitfalls, challenges, and issues you had in this iteration? How can you address them to improve the process in the next iteration? Did anything not go according to plan? Why so and how to avoid the same mistake? Write a personal reflection on what you learned in this iteration (even if a small technical thing like Database storage).]

5.6 Iteration/Sprint 5

5.6.1 Planning

[Which stories did you plan for this iteration/sprint. Add the total points for this plan. You can also explain the reason behind your planning, and what major feature(s) your team is focusing on delivering by completing these stories. You may use a table for a summary display of the planning, but elaborate in text more detail in your focus and feature plan.]

5.6.2 Work Done

[Which stories did you complete in this iteration/sprint. Which ones did you partially complete? Who worked on which story? You may elaborate in paragraph(s) to add more detail about the work done.]

5.6.3 Testing Coverage

[Testing is very important. Show your coverage here. Is this coverage good enough? Explain why you think so. Is it not good enough? Explain a plan to increase the coverage. You may also elaborate on why some artifacts do not undergo much testing. If the testing changed from the last iteration, explain the reasons.]

5.6.4 Retropective & Reflection

[What were the pitfalls, challenges, and issues you had in this iteration? How can you address them to improve the process in the next iteration? Did anything not go according to plan? Why so and how to avoid the same mistake? Write a personal reflection on what you learned in this iteration (even if a small technical thing like Database storage).]

6 Final Remarks

6.1 Overall Progress

[Have you completed everything? If so, present evidence on how you brought value to your client, and the overall client satisfaction. Otherwise, estimate how much progress you done and how long it would take to finish this project.]

6.2 Project Reflection

[Your personal reflection on the project. What lessons did you learned. What would you have done differently. How can you do better work in future projects? You may write this as a team or per person (or both)]

Appendix

[Appendix section if needed]