

Project 07:
A Cognitive Training Quiz
Application

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Mentors:

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Project Motivation

- Older adults often have difficulty with spatial memory and navigation.
- There is a test to help develop and assess these cognitive skills, but it's currently a pencil-and-paper test.
- Digitizing this test would enable access by so many more individuals.

Project Description

- Create a web-based visuospatial cognitive training program
 - Has 5 modules and progressively trains participants
- Custom-designed graphics and animations supplied by the Arts as Applied to Medicine Department
- Employ user experience design and gamification to enhance the test

	A	B	C	D	E	F
8.						
9.						
10.						
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13.						
14.						
15.						

Requirements

- Allow elderly patients to self-administer cognitive visual/spatial training and testing
- Application should attempt to replicate current written test, while improving the ease with which physicians can collect, access, and monitor patient data
- HIPAA Compliance

Use-Cases

- Actors: Physicians, Patients
- Physician:
 - Logs in, arrives at dashboard of patients
 - Selects patient and views their testing history
- Patient:
 - Logs in, arrives at dashboard of quiz modules
 - Selects module, completes training, then test
 - Also able to view their own testing history

Architecture

- RESTful API backend
 - Spring/Hibernate/H2(SQL)
- Platform agnostic web-app
 - AngularJS
 - Unsemantic
 - Responsive design

Client



Front-end



unsemantic

Back-end



ORM



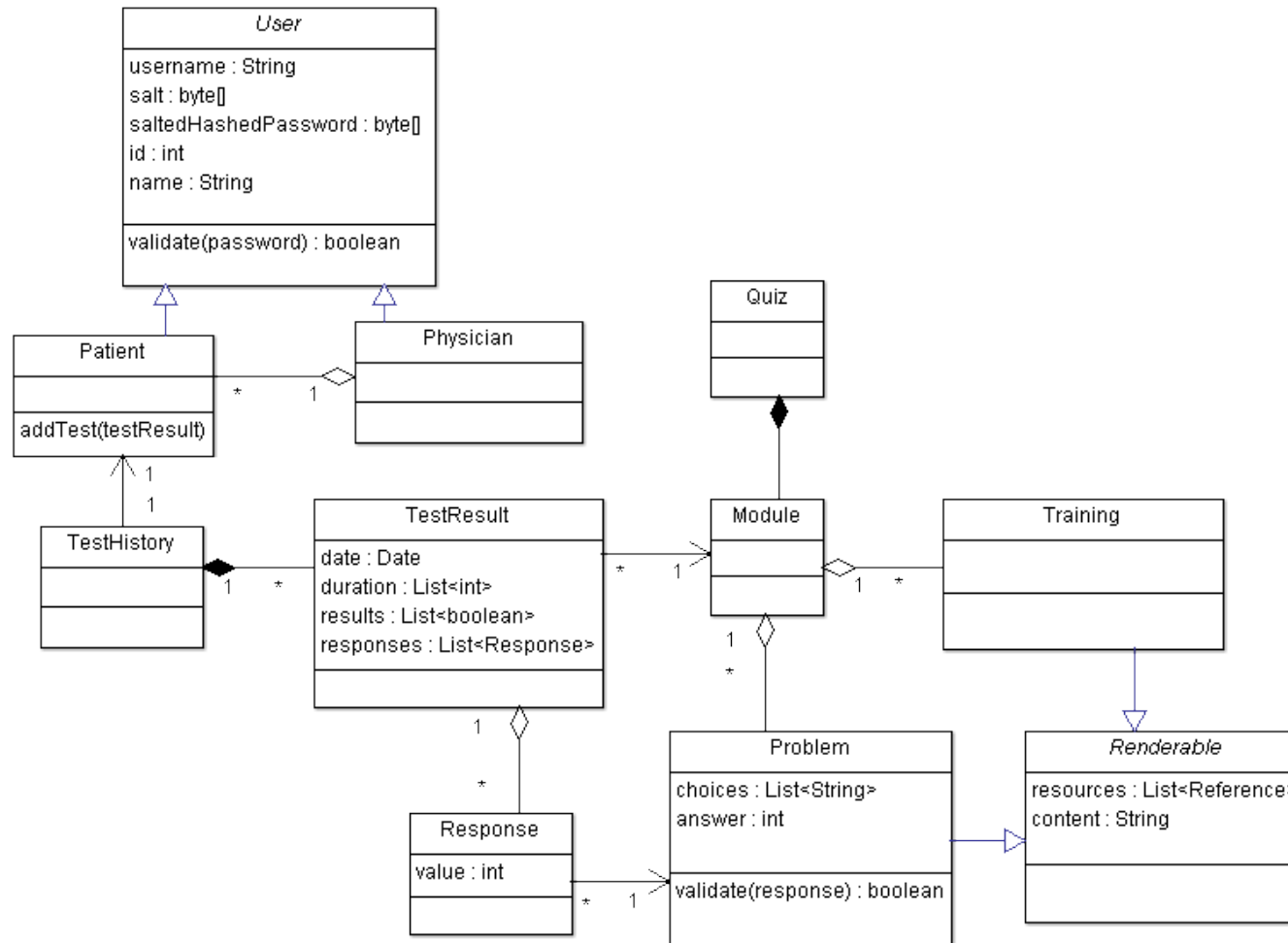
Database



RESTful API Specification

- REST endpoints are routes mapped to controllers
 - Parameters are passed as JSON in the body of HTTP requests
- Example:
 - User login endpoint
 - Path: `/api/user/login`
 - Method: `POST`
 - Parameters: `username [String], password [String]`
 - Success response:
 - Code: `200`
 - ```
{
 "accessToken" : [String]
}
```

# UML Class Diagram





# UI Sketches

Login

Physician  
Dashboard

Patient  
Dashboard



# Deliverables

- Design documents
- Production code
- Iterations on the above
  - Particularly on refining UI/UX
  - Build, deploy, obtain feedback, revise design

# Deliverables

- **Minimum:**
  - Design documents & UI mockup
  - HIPAA-Compliant, Encrypted Database
  - Serve the quiz (3 out of 5 modules)
  - Working barebone interface
- **Expected:**
  - Serve all 5 modules of the quiz
  - Store results, allow patients to view own results, allow physicians to view their patient's results
  - Polished UI
  - Plot performance history over time
- **Maximum:**
  - Data analytics on stored data
  - Allow for advanced queries on data
  - Conduct usability studies/pilot studies with actual patients

# Dependencies

- Software dependency management: npm, bower, mvn – **Done**
- Test question illustrations – **Arts as Applied to Medicine Department**
- Stash (Git) access – **Pending (waiting for confirmation from Michael)**
- Jira access – **Pending (waiting for confirmation from Michael)**
- Possible deployment environment – **Pending**

# HIPAA Compliance

- Full-database encryption, user authentication, HTTPS, access logs
- Consult Mike regarding security in general

# Management Plan

- Team meetings: Sundays and Wednesdays
- Weekly meeting with TIC: Wednesday 12:00-1:00 PM
- Use Jira for project management and Stash (Git) for version control

| Ran                                          | Nick                          |
|----------------------------------------------|-------------------------------|
| Encryption and Creation of Database, Backend | UI Design and Mockup Creation |
| Data Storage/Viewing                         | User Studies                  |
| Polish UI                                    |                               |

Introduction

Design

Dependencies

Division of Labor

Timetable

2016



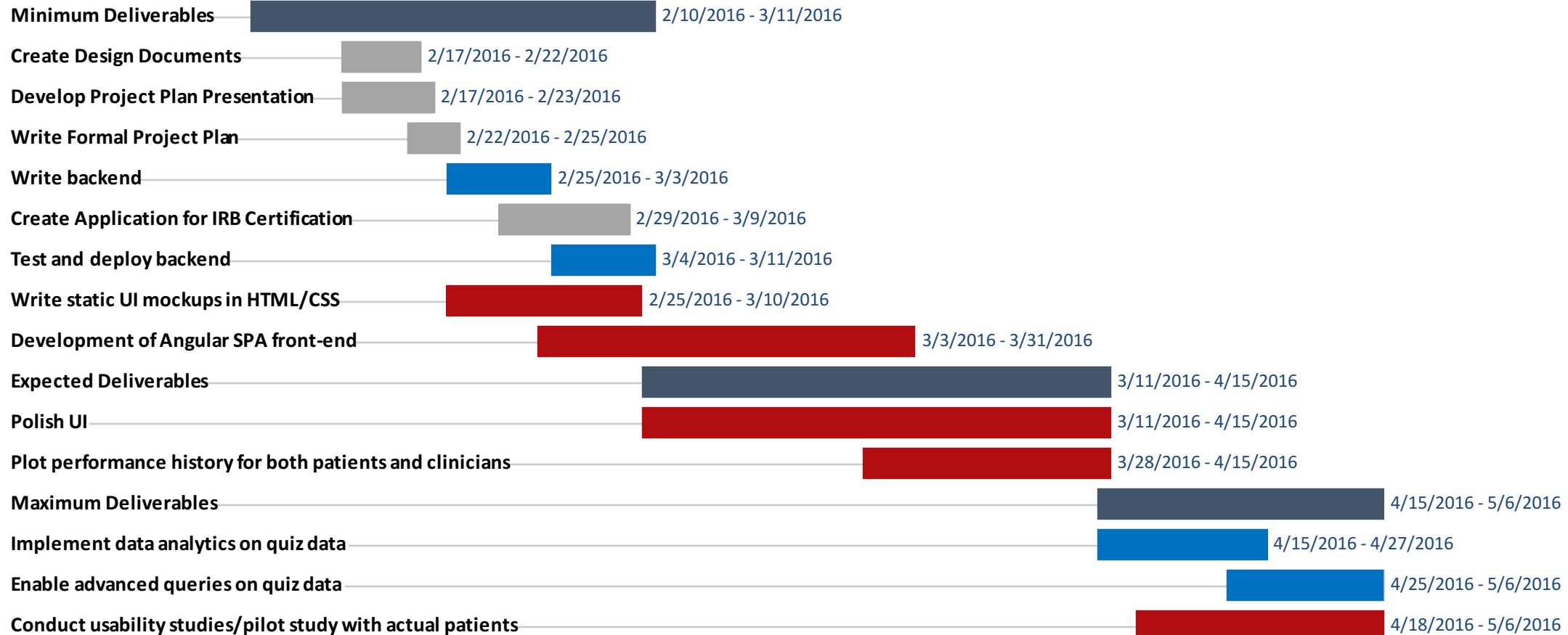
Min Deliverables  
3/10/2016

Paper Seminar  
3/24/2016

Expected Deliverables  
4/15/2016

Maximum Deliverables  
5/6/2016  
Final Poster Session  
5/6/2016

Today



# Questions?