Team Contract:

(1) All team members are expected to maintain open communication about their assigned tasks and notify the rest of the team of their progress multiple times a week or upon being asked. In continuation, team members must remain honest about their progress or any issues they may encounter while working on the project. If a team member is to encounter any setbacks, the team must be notified right away to avoid deadline issues. Do not be afraid to ask for help; we are working together as a team, and will move forward as one.

(2) Team members are expected to sufficiently document their code and strive for readability to ensure a clean work environment that works for everyone.

(3) In case of conflict or repeatedly missed deadlines by a team member, the group will have a meeting as soon as possible. If the group meeting fails to resolve the issue, or a team member becomes a repeated offender, Professor Early will be notified to meet with the group at the nearest possible time to help us proceed with the project.

(4) Team members must maintain an open mind. We are all different people with different interests and skills. We must acknowledge this as a strength, and come together to create the best piece of software that satisfies all of us, including the client. We will do our best to implement every feature agreed on by a majority vote. If the vote is split evenly between the group, we will work together to find a middle ground. No team member should dislike what we are working on as a group, especially considering this is a semester-long project. We will all agree on a project that interests us all. (REMEMBER: If you do not like something, SPEAK UP! Communication is *valued*, never looked down upon).

(5) Lastly, a team member must be diligent and aware of their own responsibilities. Other team members will not consistently be there to motivate you. Know that we are all working together, and therefore you must *play your part*.

Mission Statement:

Our team strives to create a product for our client that we can all be satisfied with. Along the way, we will improve and gain experience with working in a team, managing our time, organizing a sizeable project, and expanding our collaborative programming abilities.

Software Requirements Specification

For

<Centro Bus Data Project>

Version 1.0 approved

Prepared by

Thomas Kressman
Anthony Impellizzeri
Tae Young Park
Eugene Lee

<Team 4>

<9/20/2019>

Table of Contents

Revision History

Name	Date	Reason For Changes	Version

1. Introduction

1.1 Purpose

The purpose of our project is a web application that sends information quickly by linking it to the corresponding web page of Centro bus. The focus is on convenience for bus users. The three essential elements we will make in this application are this.

1.1.1 Easy and easy to use for everyone who uses this app. (User-friendly interface)

1.1.2 Real-time and bring bus information for every 30 seconds.

1.1.3 Notify the time the bus arrives and the time it takes to reach the destination.

1.1.4 Show bus location so that user can also estimate.

1.2 Document Conventions

Every document from the Centro website has priorities. Which is in https://www.centro.org/about-Centro/documents-and-forms.

1.3 Intended Audience and Reading Suggestions

1.3.1 Centro bus user
1.3.2 Centro bus company
1.3.3Centro bus employee

1.4 Product Scope

1. Receiving information from the server(real-time)
    - For the specific plan for the user
2. User-friendly interface
    - This application is for the convenience so must be easy to use
3. Mark bus GPS on the map
    - Part of estimate when the bus comes or check the next available bus.
4. Estimate the arrival time
    - For the specific plan for the user
5. Estimate when the bus comes

- For the specific plan for the user

1.5 References

a. Centro bus website
b. Centro bus web-detail
c. Centro bus server (to get information)

   https://www.centro.org/

d. PHP(HTML)

   https://www.php.net/

e. SQL

2. Overall Description

2.1 Product Perspective

A web application which is our project is already running online. From the Centro bus Web, the project aims to improve functions based on existing apps.

2.2 Product Functions

* Provide accurate information to users (bus schedule, arrival time, etc.)
* Convenient and uncomplicated system for easy access for users

2.3 User Classes and Characteristics

The main users should be passengers trying to get on the bus or developers to build something similar to this product. Passengers will want to identify their desired destination and time zone. They can get information from the bus schedule and can use it whenever needed. Developers will use this product to become the basic model of the program they want to create. It will be a reference for how the GUI or program work.

2.4 Operating Environment

The software will operate as a web application on personal computers and should be able to work on all operating systems, including Windows, Mac, and Linux.

2.5 Design and Implementation Constraints

- Since the application will be run on personal computers, and since the processing speeds on personal computers vary, the application must be organized in a way in which it doesn't significantly slow down the process of what the user wants if they are using a slower computer.
- That being said, the computer must be able to have a good enough memory in order to process the application's possibly large amount of inputted data in the first place.

2.6 User Documentation

The web app will include an online manual/guide, and possibly a link where a user can get online help, just in case one isn't sure exactly how to use the software to their benefit.

2.7 Assumptions and Dependencies

Since this application is building off of data given through Centro, it heavily depends on such information in order to give the best benefit to the users as possible, allowing them to know all the patterns of buses near them through records, and when a bus will actually arrive. Therefore, it is assumed that the information given by Centro is as accurate as it can possibly be.

3. External Interface Requirements

3.1 User Interfaces

Implementing an efficient user interface requires simple and convenient accessibility. The main categories are bus schedule, help, introduction to Centro, bus location, trip planner, and so on. These use words and pictures to make it easier for users to see.

3.2 Hardware Interfaces

Our program is a web-based product. Therefore, we need a protocol that can be accessed by many users. For this reason, TCP / IP is the most common protocol and is used for general purposes.

On the physical side, we need a computer that can run the server. Instead of just using one server computer, we need several computers. If we have a problem with one server computer, we need a replacement computer. Each computer is also in a state of sharing information.

3.3 Software Interfaces

PHP

a. To design the web page

To fetch the information from the server/database

a. JavaScript basics
b. Basics of Client-side APIs
c. MySQL

3.4 Communications Interfaces

Build a web server based on PHP to specify communication via a web browser or email directly to the developer.

4. System Features

4.1 Receiving Information from the Server

4.1.1 Description and Priority

The main service is to inform the people who want to get on the bus, the exact arrival time of the bus.

High priority:

*Provide accurate time information

*Provide an interface that users can easily access

4.1.2 Stimulus/Response Sequences

The project will set the response sequence as fast as possible because it is aimed to provide fast and accurate information.

4.1.3 Functional Requirements

REQ-1: SQL which is a domain-specific language. It is designed for managing data held in a relational database management system, or for stream processing in a relational data stream management system.
REQ-2: PHP is designed to create dynamic web pages. Receives database information using SQL and integrates with PHP to implement web applications.

4.2 User-friendly Interface

4.2.1 Description and Priority

The Purpose of this application is to make it easier, more comfortable, and more accurate for users to use the bus. It is for efficient time management through more accurate planning.

High priority:

*Simple Interface

*Provide accurate time for easy planning

4.2.2 Functional Requirements

REQ-1: HTML
REQ-2: PHP
REQ-3: Google Map (TBD)

5. Other Nonfunctional Requirements

5.1 Performance Requirements

Since the user of this product will be given the option to input large amounts of data, the software must utilize the proper data structure to allow for efficient processing times. All in all, the product should take no longer than a few seconds to output the desired information to the user.

5.2 Safety and Security Requirements

Considering there will be no personal data of the user being exchanged between the web application and the database, there are arguably no safety or security requirements for this product.

5.3 Software Quality Attributes

Reliability and Correctness - Our product will try to deliver the most accurate estimations for bus arrival times based on the past data of the users' selected route and bus stop. Since the application will deliver output based solely on estimations, 100% accuracy on bus arrival times is never to be expected, but rather used as a reference for their trip planning.
Maintainability - The web application will be easily maintained via the developers throughout the course of the semester. If a bug is to be found, the software should be written in a way that it could easily be corrected without causing further errors.

Usability - The product will prove to be user-friendly through the simplistic design of the interface. A user with no prior knowledge of our product should be able to get the desired information upon the first encounter, granted they are familiar with the Centro Bus platform.
Efficiency - The web application will utilize the proper data management resources available to ensure the fastest output time possible.
Reusability - This web application will always prove to be useful until busses no longer exist.

6. Other Requirements

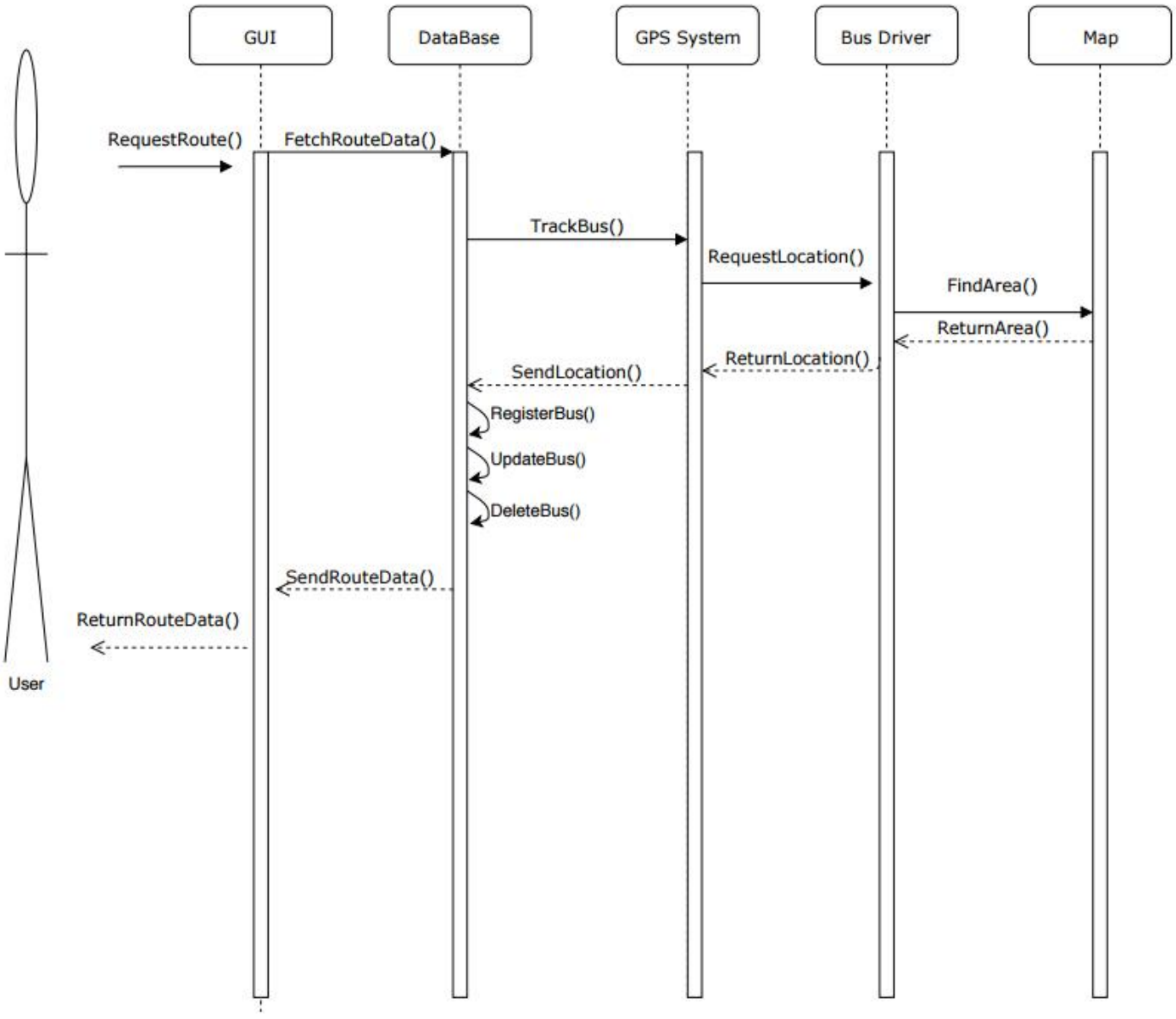
Requirements in this field will be added as needed.

UML Sequence Diagram and Statet Diagram

Thomas Kressman
Anthony Impellizzeri
Tae Young Park
Eugene Lee

<Team 4>

<10/4/2019>


GUI
DataBase
GPS System
Bus Driver
Map
User
RequestRoute()
FetchRouteData()
TrackBus()
RequestLocation()
FindArea()
ReturnArea()
ReturnLocation()
SendLocation()
RegisterBus()
UpdateBus()
DeleteBus()
SendRouteData()
ReturnRouteData()

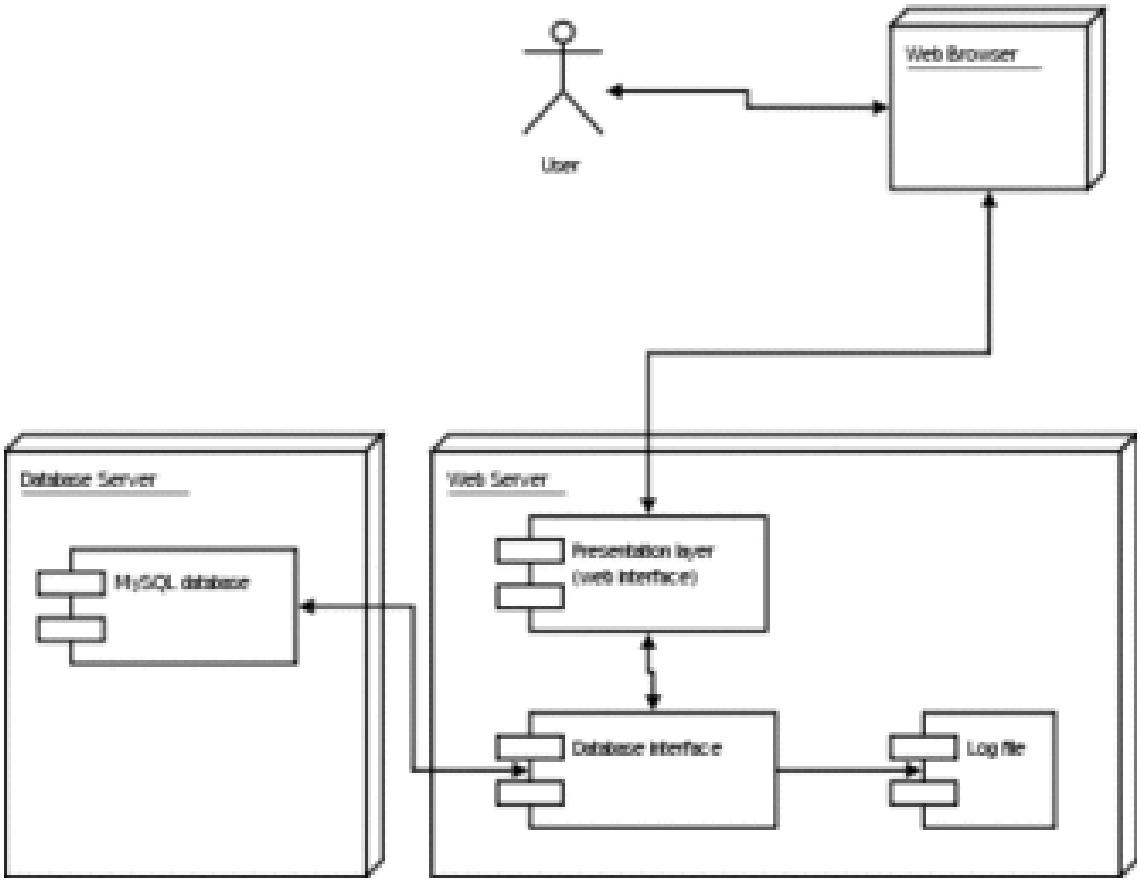
User
- +Bus Route
    - +Specific bus route time

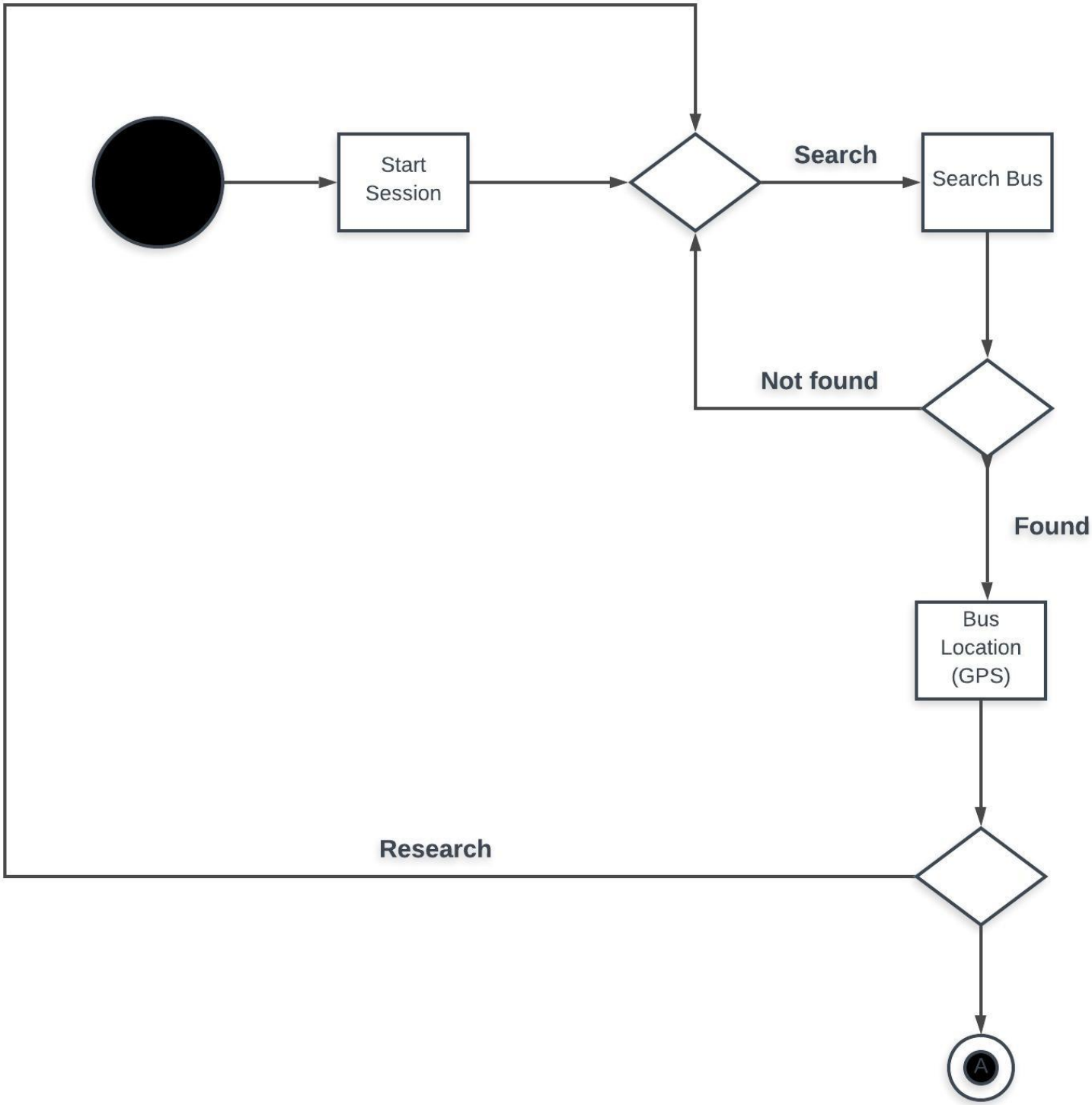
Bus Route
- +Selected Route/Bus Number
    - +From/To Location
        - +Selected Scheduled bus
            - Selected Day(s)/Month(s)/Year(s)
            - Past arrival data

Output

-Averaged arrival time data

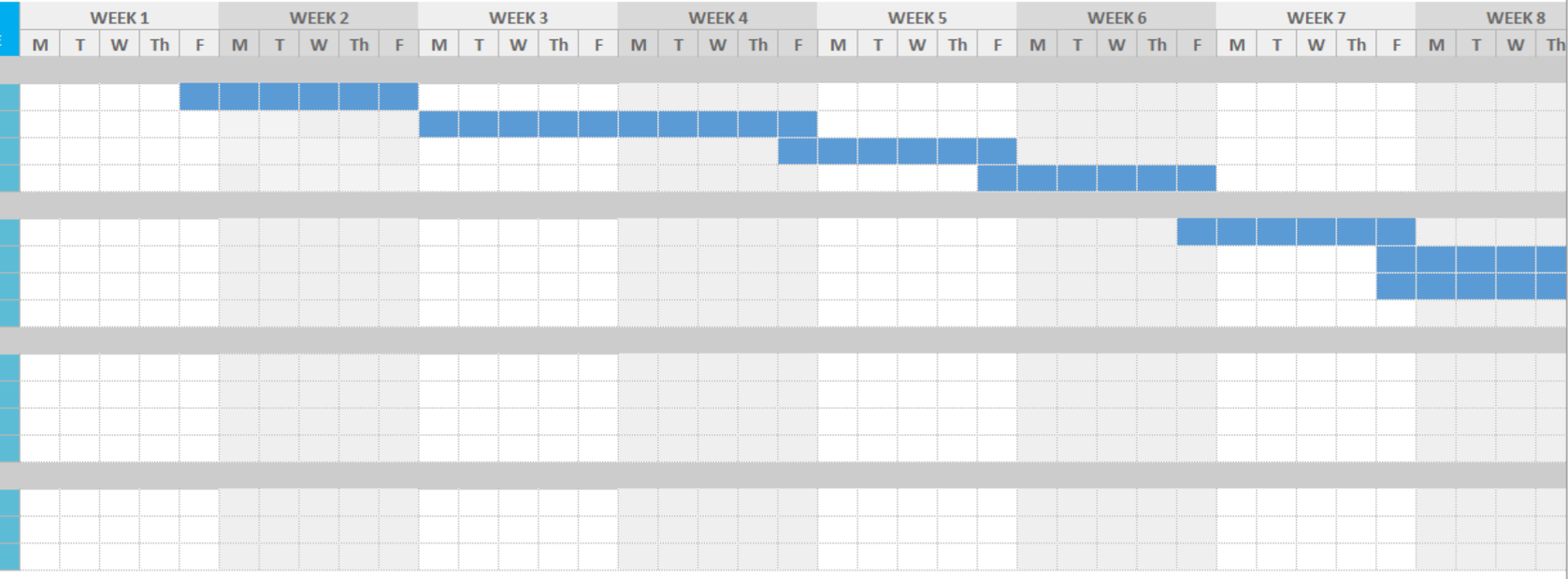
Database
- Past information about bus routes (time log, tendencies, etc.)

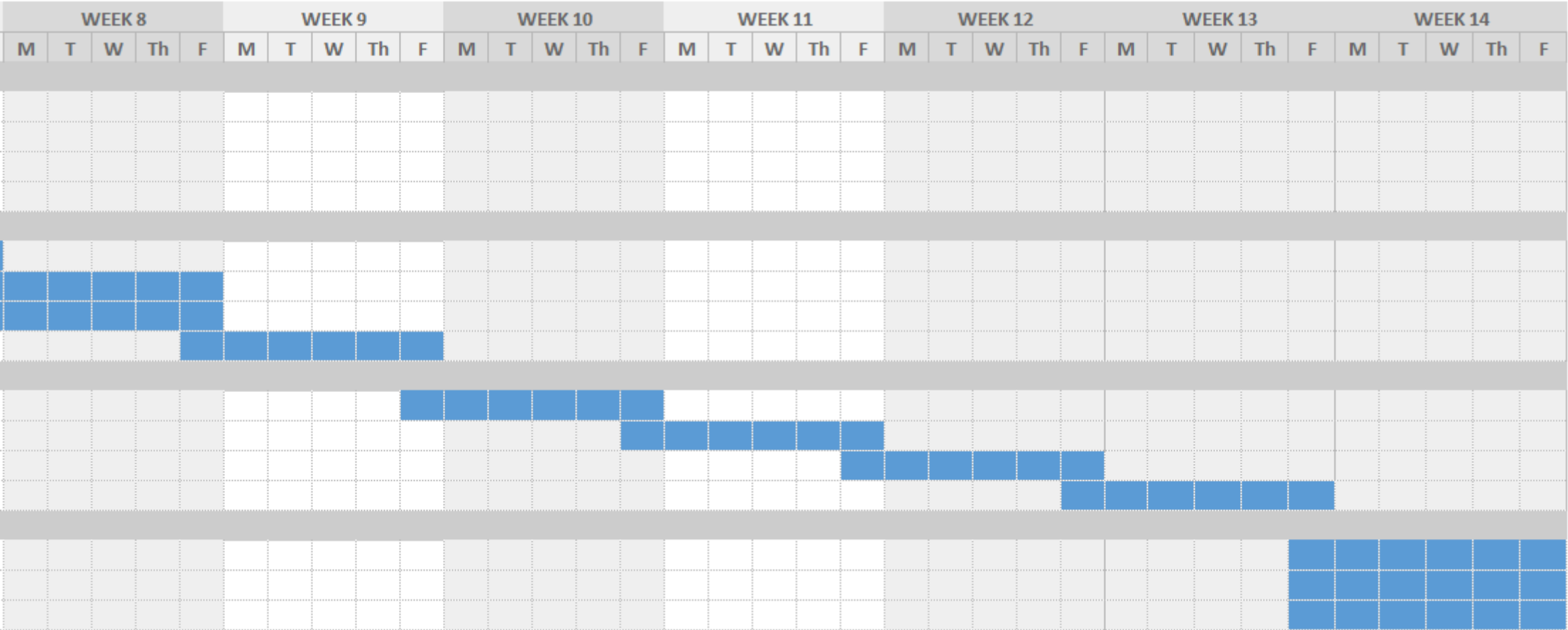


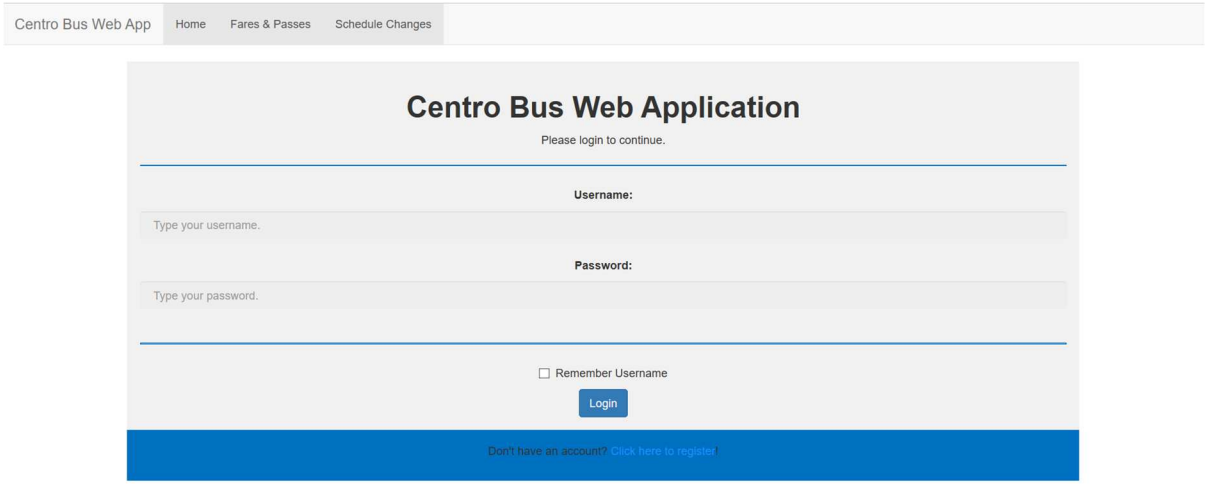

Start Session
Search
Search Bus
Not found
Found
Bus Location (GPS)
Research
A

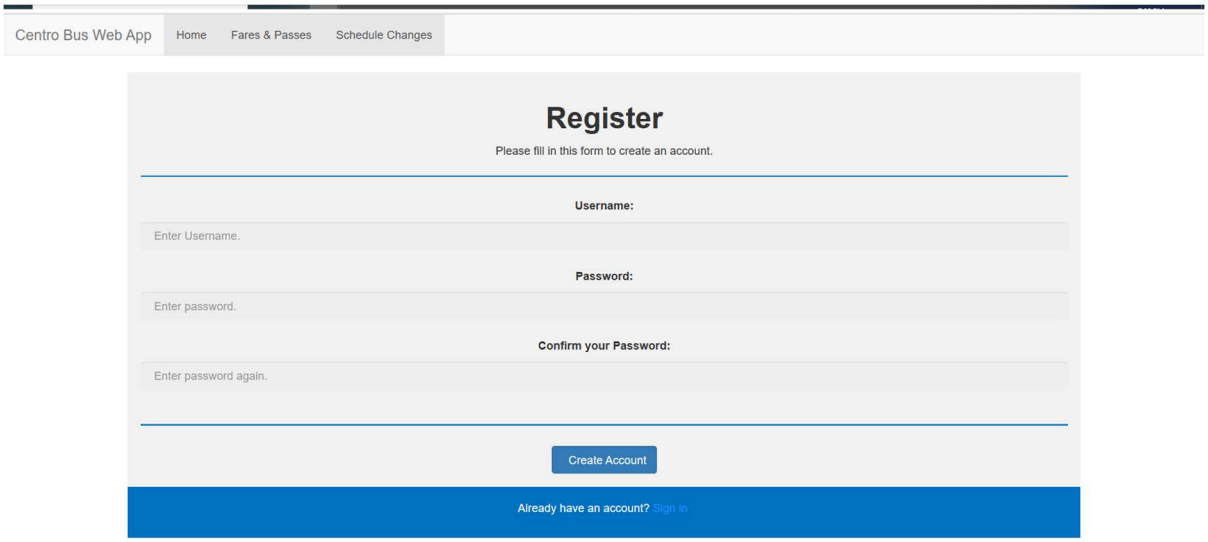
GANTT CHART TEMPLATE

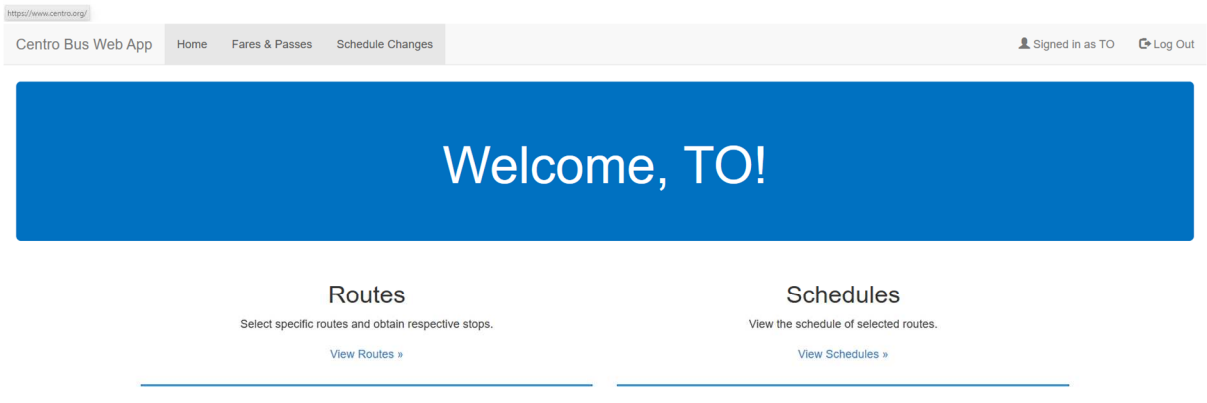
TASK NAME	START DATE	END DATE	DURATION (WORK DAYS)	TEAM MEMBER	PERCENT COMPLETE
Plan					
Choose Project	8/26	9/9	11	Team 4	100%
Requirements Document	9/9	9/20	10	Team 4	100%
UML Diagram	9/20	10/5	11	Taeyoung	100%
Gantt Chart	10/5	10/11	5	Team 4	100%
Design					
Design Database	10/11	10/18	6	Eugene	100%
Software Design	10/18	10/25	6	Taeyoung	100%
Interface Design	10/18	10/25	6	Eugene	100%
Create Design Specification	10/25	11/1	6	Thomas	100%
Code					
Develop System Modules	11/1	11/8	6	Eugene	100%
Integrate System Modules	11/8	11/15	6	Taeyoung	100%
Perform Initial Testing	11/15	11/22	6	Anthony	100%
Development Complete	11/22	11/29	6	Thomas	100%
Test					
Perform System Testing	11/29	12/6	6	Taeyoung	100%
Document Issues Found	11/29	12/6	6	Team 4	100%
Correct Issues Found	11/29	12/6	6	Anthony	100%

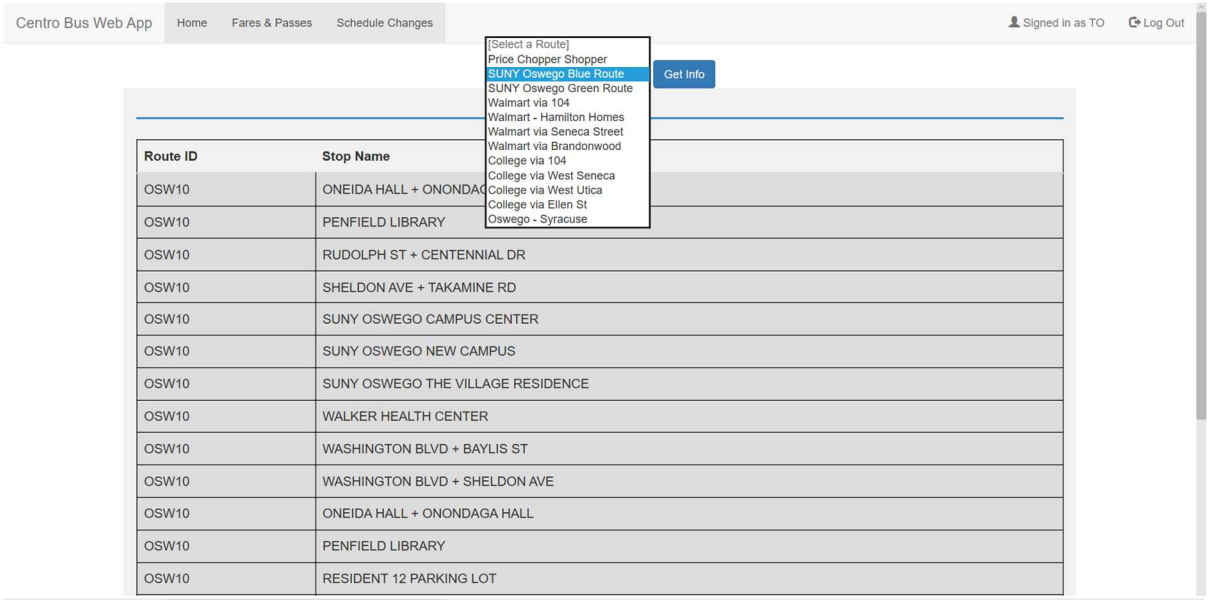



WEEK 8
WEEK 9
WEEK 10
WEEK 11
WEEK 12
WEEK 13
WEEK 14
M T W Th F M T W Th F M T W Th F M T W Th F M T W Th F M T W Th F M T W Th F

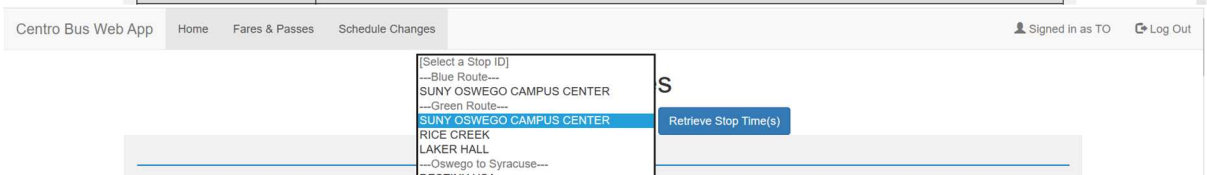

Centro Bus Web App
Home
Fares & Passes
Schedule Changes
Centro Bus Web Application
Please login to continue.
Username:
Type your username.
Password:
Type your password.
Remember Username
Login
Don't have an account? Click here to register!


Centro Bus Web App
Home
Fares & Passes
Schedule Changes
Register
Please fill in this form to create an account.
Username:
Enter Username.
Password:
Enter password.
Confirm your Password:
Enter password again.
Create Account
Already have an account? Sign in


https://www.centro.org/
Centro Bus Web App
Home
Fares & Passes
Schedule Changes
Signed in as TO
Log Out
Welcome, TO!
Routes
Select specific routes and obtain respective stops.
View Routes »
Schedules
View the schedule of selected routes.
View Schedules »



Route ID	Stop Name
OSW10	ONEIDA HALL + ONONDAG
OSW10	PENFIELD LIBRARY
OSW10	RUDOLPH ST + CENTENNIAL DR
OSW10	SHELDON AVE + TAKAMINE RD
OSW10	SUNY OSWEGO CAMPUS CENTER
OSW10	SUNY OSWEGO NEW CAMPUS
OSW10	SUNY OSWEGO THE VILLAGE RESIDENCE
OSW10	WALKER HEALTH CENTER
OSW10	WASHINGTON BLVD + BAYLIS ST
OSW10	WASHINGTON BLVD + SHELDON AVE
OSW10	ONEIDA HALL + ONONDAGA HALL
OSW10	PENFIELD LIBRARY
OSW10	RESIDENT 12 PARKING LOT



Time	Day
7:35	1
8:00	1
8:30	1
9:00	1
9:30	1
10:00	1
10:30	1
11:00	1
11:30	1
12:00	1
12:30	1
13:00	1