UFV Interactive Map

COMP 371 ON1 Term Project

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Objective of the UFV Interactive Map

- The original objective of this project was to create an interactive UFV map so that visitors and first time students can easily navigate the Abbotsford campus.
- Functions proposed included:
  - Clickable buildings to display information about the building
    - Hours of operation, floor numbers, and room numbers
    - Fast food joint, hours of operation, and menu
  - Allowing the user to input directions into a search bar on the map to find specific rooms on campus.
    - Specified address would include building letter and room number
    - e.g. Start Point: Building B B121 and End Point: Building S 2103a

Inception: Gantt Chart of Proposed Plan

- In order to avoid the use of the waterfall method and to keep to a Unified Process a Gantt Chart was created

- According to the *COMP371 Lab #1*, Page 1, “A Gantt chart is a Network Diagram. The key features contained in a Gantt chart are: Tasks, Duration of the tasks, Completeness, and the signature horizontal bar to indicate the duration length and the order of the task”

Inception: Gantt Chart of Proposed Plan

Task name	Start Date	End Date	Duration	Completeness
Term Project Proposal	**10/10/2022**	**10/17/2022**	**8 days**	**100%**
Write up Inception	10/10/2022	10/13/2022	4 days	100%
Create Gantt Chart for Term Project	10/10/2022	10/16/2022	7 days	100%
Determine the first elaboration	10/13/2022	10/16/2022	4 days	100%
Create UML Diagrams for UFV Interactive Map	10/14/2022	10/16/2022	3 days	100%
Write Proposal Report explaning project	10/15/2022	10/17/2022	3 days	100%
Term Project Milestone	**10/18/2022**	**10/31/2022**	**14 days**	**0%**
Document troubles and drawbacks	10/18/2022	10/28/2022	11 days	0%
Complete more thorough elaboration for Project	10/18/2022	10/19/2022	2 days	0%
Create Use Case Diagram	10/20/2022	10/22/2022	3 days	0%
Create Use Case Document	10/23/2022	10/25/2022	3 days	0%
Create Domain Model	10/26/2022	10/28/2022	3 days	0%
Create System Sequence Diagram	10/18/2022	10/28/2022	11 days	0%
Write Milestone Report on project progress	10/29/2022	10/31/2022	3 days	0%
Term Project Final Report/Presentation	**11/1/2022**	**11/21/2022**	**21 days**	**0%**
Assign roles for the construction and transition of the project	11/1/2022	11/2/2022	2 days	0%
Write report for how HTML would be implemented	11/1/2022	11/18/2022	18 days	0%
Create a theoretical construction of the HTML that could be put to use	11/1/2022	11/9/2022	9 days	0%
Create a theoretical transition of the HTML	11/10/2022	11/18/2022	9 days	0%
Write report for how CSS would be implemented	11/1/2022	11/18/2022	18 days	0%
Create a theoretical construction of CSS that could be put to use	11/1/2022	11/9/2022	9 days	0%
Create a theoretical transition of the CSS	11/10/2022	11/18/2022	9 days	0%
Write report for how Javascript would be implemented	11/1/2022	11/18/2022	18 days	0%
Create a theoretical construction of javascript that could be put to use	11/1/2022	11/9/2022	9 days	0%
Create a theoretical transition of the Javascript	11/10/2022	11/18/2022	9 days	0%
Record video presenting the webpage	11/19/2022	11/21/2022	3 days	0%
Put together Final Report for Term Project	11/19/2022	11/21/2022	3 days	0%
Term Project Implementation/Prototype	**11/22/2022**	**12/5/2022**	**14 days**	**0%**
Create the UFV Interactive Map webpage	11/22/2022	12/4/2022	13 days	0%
Code the HTML	11/22/2022	12/4/2022	13 days	0%
Code all objects shown in the Elaboration Phase	11/22/2022	11/28/2022	7 days	0%
Test with given CSS and Javascript	11/29/2022	12/4/2022	6 days	0%
Code the CSS	11/22/2022	12/4/2022	13 days	0%
Code the style of the webpage	11/22/2022	11/28/2022	7 days	0%
Test with given HTML and Javascript	11/29/2022	12/4/2022	6 days	0%
Code the javascript	11/22/2022	12/4/2022	13 days	0%
Code the functionality of the webpage	11/22/2022	11/28/2022	7 days	0%
Test with the given HTML and CSS	11/29/2022	12/4/2022	6 days	0%
Put together Protype and Submit	12/5/2022	12/5/2022	1 day	0%

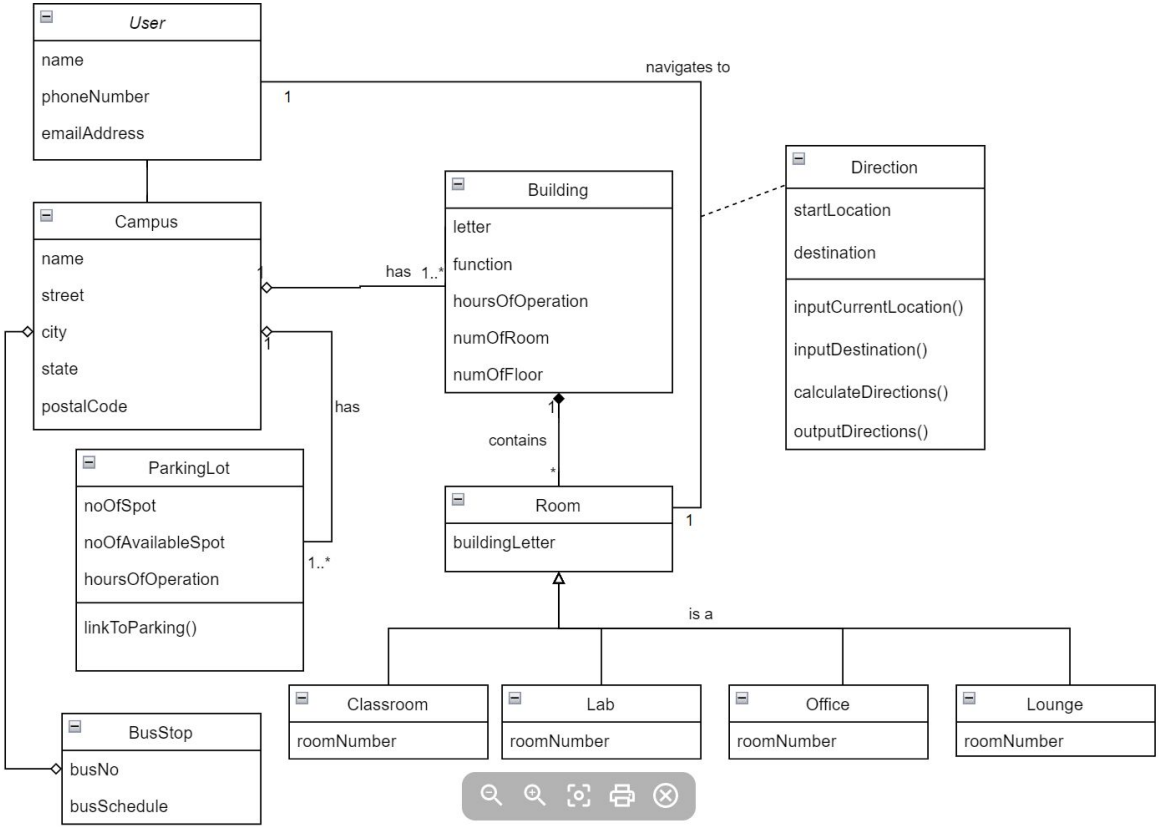
Inception: Domain Model from the Project Proposal

- To give us a visualization of the project, a Domain Model was also created to display the classes the project would contain along with the attributes proposed.

- According to the textbook, *Applying UML and Patterns: An Introduction to Object-Oriented Analysis and Design and Iterative Development 3rd edition*, Page 131, “A domain model is the most important…model in OO analysis. It illustrates noteworthy concepts in a domain.”

- “The term “Domain Model” means a representation of real-situation conceptual classes, not of software objects.” (*Applying UML and Patterns: An Introduction to Object-Oriented Analysis and Design and Iterative Development 3rd edition*, Page 134)

Inception: Domain Model from the Project Proposal



Elaboration: Creation of the UML Diagrams

- In order to avoid the use of the waterfall method and to keep to a Unified Process, UML Diagrams were constructed to elaborate on how the map would work, the functionalities included and their relationship among each of the parts.

- According to the textbook, *Applying UML and Patterns: An Introduction to Object-Oriented Analysis and Design and Iterative Development 3rd edition*, Page 18, "[The] waterfall values [promote] big up-front speculative requirements and design steps before programming…the waterfall is strongly associated with the highest failure rates for software projects…"

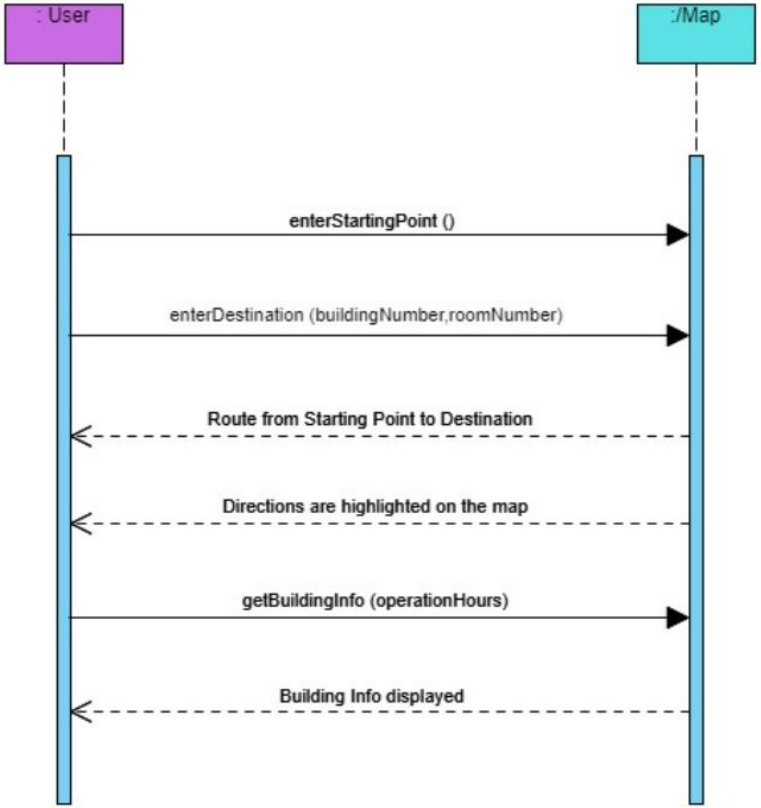
- According to the textbook, *Applying UML and Patterns: An Introduction to Object-Oriented Analysis and Design and Iterative Development 3rd edition*, Page 18, "The [Unified Process, or] UP, combines commonly accepted best practices, such as an iterative lifecycle and risk-driven development, into a cohesive and well-documented process description."

Elaboration: System Sequence Diagram

- A System Sequence Diagram was created for the UFV Interactive Map to display how the system would work between the user and system interactions

- According to the textbook, *Applying UML and Patterns: An Introduction to Object-Oriented Analysis and Design and Iterative Development 3rd edition*, Page 175, “A [system sequence diagram, or] SSD shows, for a particular course of events within a use case, the external actors that interact directly with the system, the system, and the system events that the actors generate. … Time proceeds downward, and the ordering of events should follow their order in the scenario.”

Elaboration: System Sequence Diagram



Elaboration: Use Case Document

- A Use Case Document was created for the UFV Interactive Map to keep track of the details of what the map was proposed to be capable of and the different use case scenarios.

- According to the textbook, *Applying UML and Patterns: An Introduction to Object-Oriented Analysis and Design and Iterative Development 3rd edition*, Page 67, “[A use case document is also known as fully dressed use cases.] All steps and variations are written in detail, and there are supporting sections, such as preconditions and success guarantees.”

- According to the textbook, *Applying UML and Patterns: An Introduction to Object-Oriented Analysis and Design and Iterative Development 3rd edition*, Page 67, “ Fully dressed use cases show more detail and are structured; they dig deeper”

Elaboration: Use Case Document

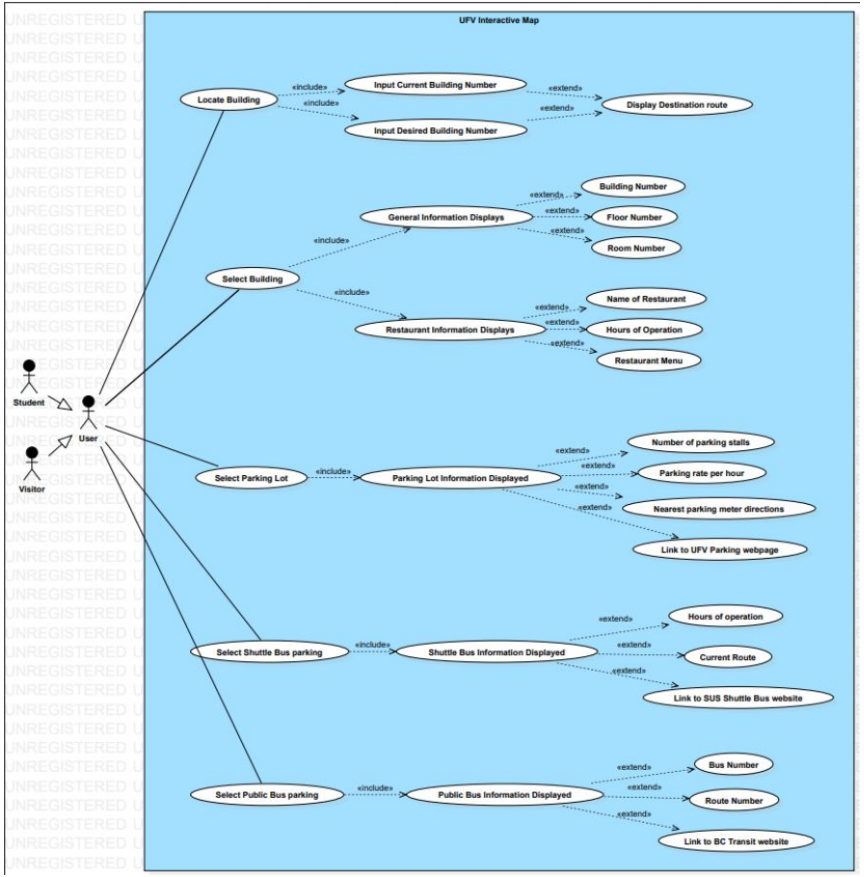
Use Case Title: UFV Interactive Map
Primary Actors: Student, Visitor
Level: User
Stakeholders: UFV President
Precondition: User looks up the UFV Abbotsford campus map
Minimal Guarentee: User is instructed to allow javascript
Success Guarentees: User can find building information, User is directed to specified buidling
Triggers: User clicks on "View Abbotsford Campus map"
Main Success Scenario 1. User inputs current buildling 2. User inputs building they wish to reach 3. Directions are generated from current building to desired building 4. Directions are highlighted on map
Extensions: 1. User selects building 1a. General Information is displayed about selected building 1aa. Building Letter 1ab. Floor numbers 1ac. Room numbers 1b. Information about a restaurant residing in the building is displayed 1ba. Name of restaurant 1bb. Hours of operation 1bc. Menu for restaurant 2. User selects parking lot 2a. Information is displayed about selected parking lot 2aa. How many stall numbers there are in the given parking lot 2ab. Rate per hour of parking 2ac. Directions to the nearest parking meter 2ad. Link to UFV Parking webpage (https://ufv.ca/parking/) 3. User selects Shuttle Bus parking 3a. Information is displayed about the Shuttle Bus 3aa. Hours of operation 3ab. Current route 3ad. Link to SUS Shuttle Bus website (https://ufvsus.ca/campus-shuttle) 4. User selects on Public Bus parking 4a. Information is displayed about the Public Bus 4aa. Bus Number 4ab. Bus Schedule 4ac. Link to BC Transit website for more information (https://transitfeeds.com/p/bc-transit/686/latest/stop/107190)

Elaboration: Use Case Diagram

- A Use Case Diagram was created for the UFV Interactive Map to keep track of the details of what the map was proposed to be capable of and the different use case scenarios in a visual format.

- According to the textbook, *Applying UML and Patterns: An Introduction to Object-Oriented Analysis and Design and Iterative Development 3rd edition*, Page 11, “[A use case diagram is also known as a UML Diagram.] the UML is the de facto standard diagramming notation for drawing or presenting pictures (with some text) related to software - primarily OO software.”

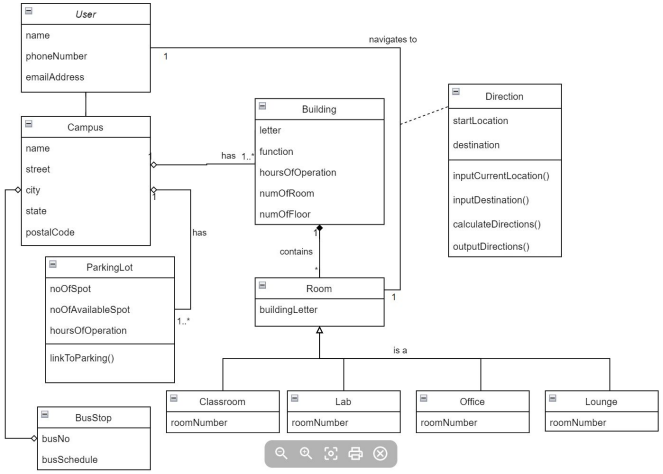
Elaboration: Use Case Diagram

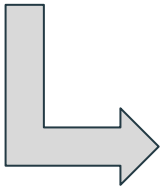


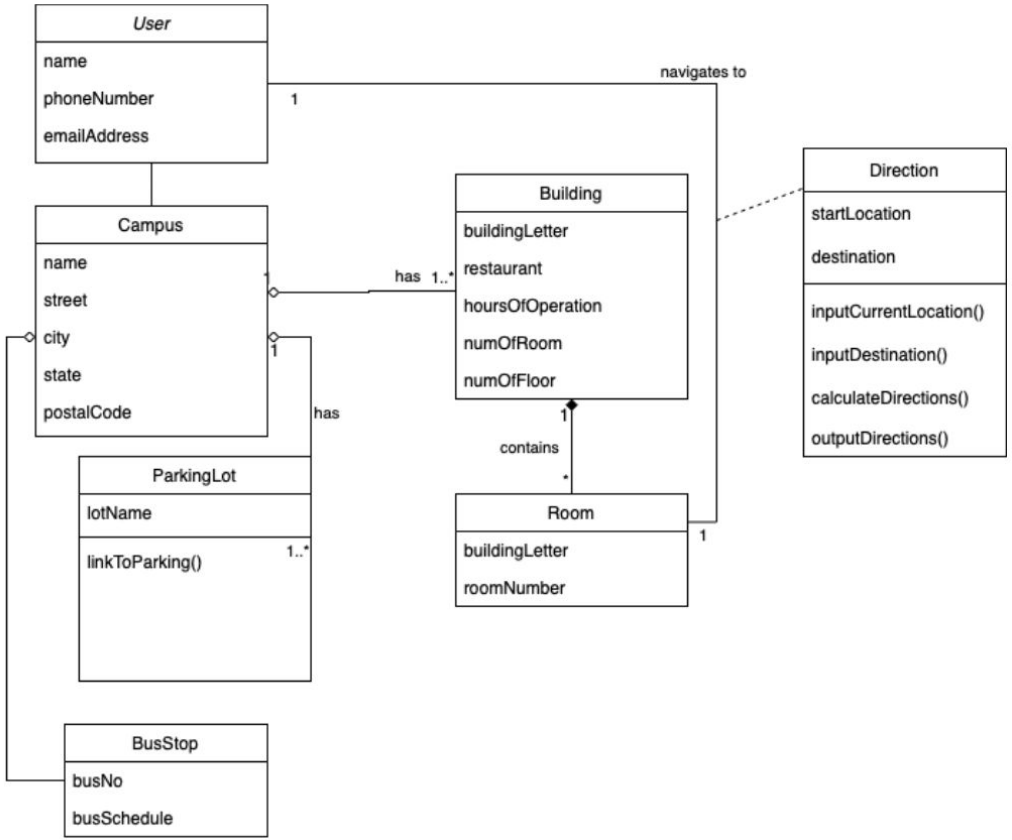
Elaboration: Updated Domain Model

- The Domain Model created in Inception was further updated in Elaboration to reflect other models created and eliminate redundancy.

Elaboration: Updated Domain Model



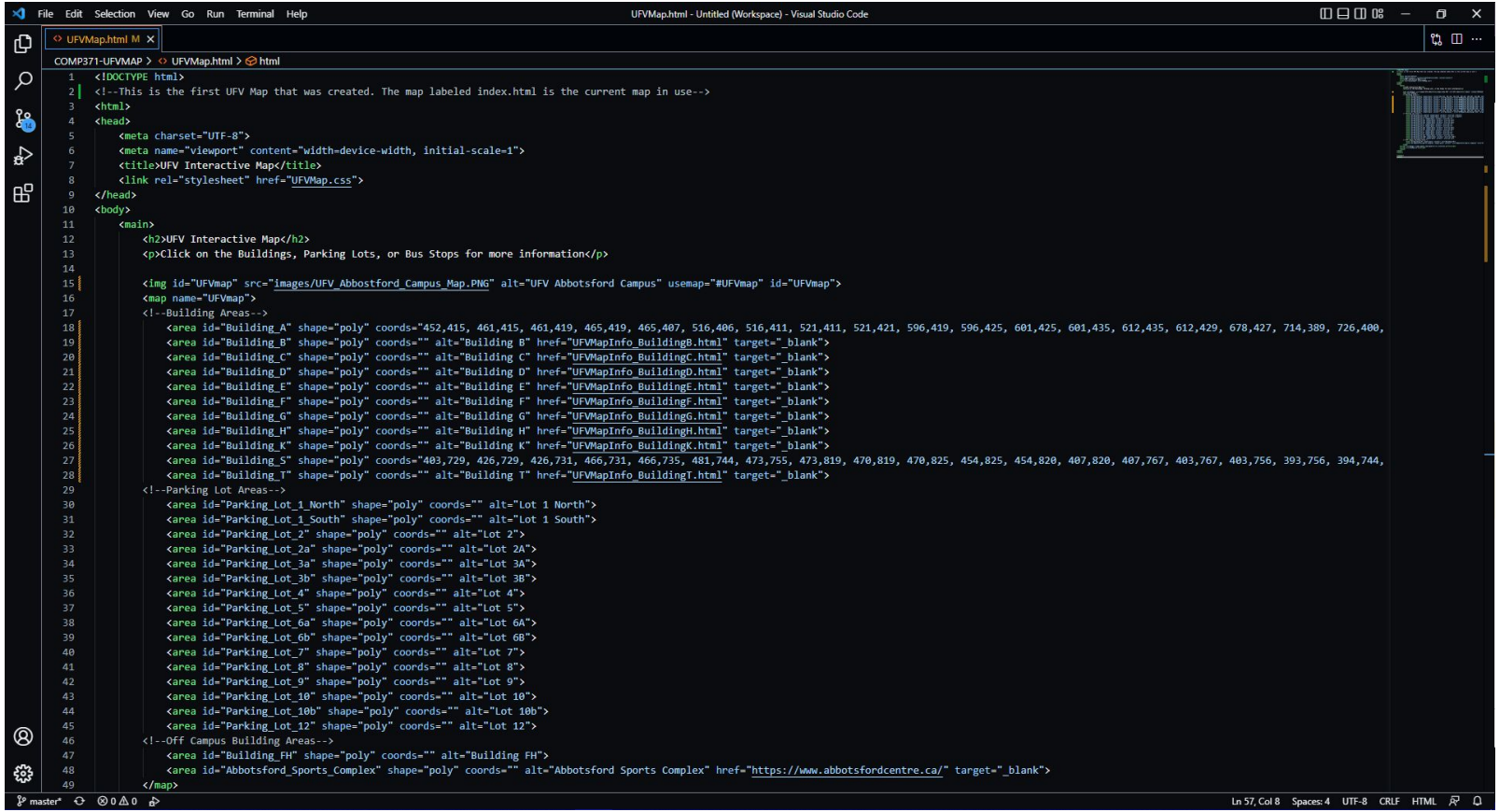




Elaboration: Coding the UFV Interactive Map

- Initially, a screen capture of the Abbotsford UFV campus was used to test out the UFV Interactive Map idea
- External HTML pages were also created to test out how much information needed to be implemented into the UFV map (this turned out to be a lot!)
- An HTML image map tag was used to treat the buildings on the map as clickable images based on their polygonic shapes traced out by their pixel measurements using Microsoft Paint

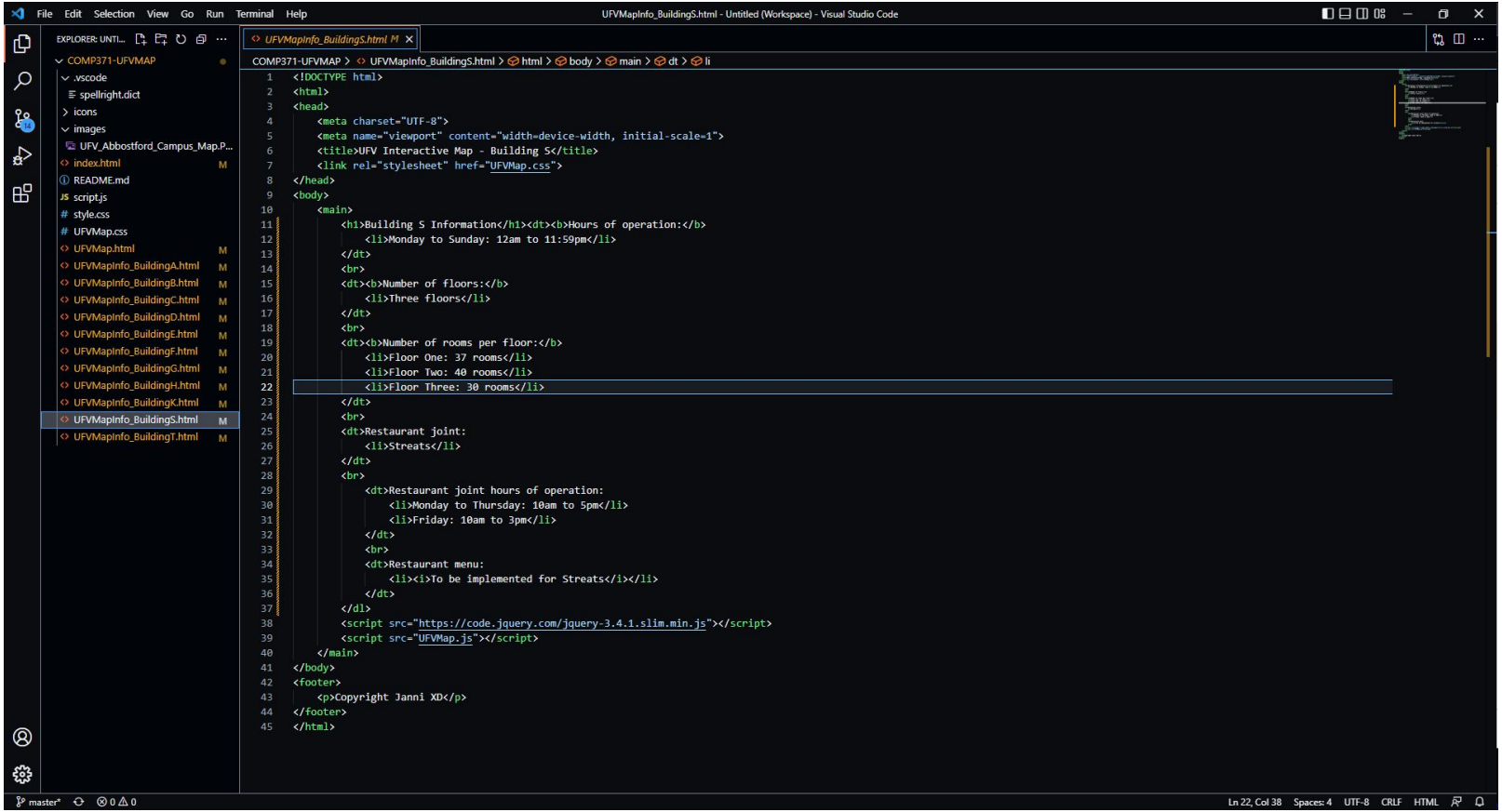
Elaboration: Coding the UFV Interactive Map




```
<!DOCTYPE html>
<!--This is the first UFV Map that was created. The map labeled index.html is the current map in use-->
<html>
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1">
    <title>UFV Interactive Map</title>
    <link rel="stylesheet" href="UFVMap.css">
</head>
<body>
    <main>
        <h2>UFV Interactive Map</h2>
        <p>Click on the Buildings, Parking Lots, or Bus Stops for more information</p>

        <img id="UFVmap" src="images/UFV_Abbostford_Campus_Map.PNG" alt="UFV Abbotsford Campus" usemap="#UFVmap" id="UFVmap">
        <map name="UFVmap">
        <!--Building Areas-->
            <area id="Building_A" shape="poly" coords="452,415, 461,415, 461,419, 465,419, 465,407, 516,406, 516,411, 521,411, 521,421, 596,419, 596,425, 601,425, 601,435, 612,435, 612,429, 678,427, 714,389, 726,400,
            <area id="Building_B" shape="poly" coords="" alt="Building B" href="UFVMapInfo_BuildingB.html" target="_blank">
            <area id="Building_C" shape="poly" coords="" alt="Building C" href="UFVMapInfo_BuildingC.html" target="_blank">
            <area id="Building_D" shape="poly" coords="" alt="Building D" href="UFVMapInfo_BuildingD.html" target="_blank">
            <area id="Building_E" shape="poly" coords="" alt="Building E" href="UFVMapInfo_BuildingE.html" target="_blank">
            <area id="Building_F" shape="poly" coords="" alt="Building F" href="UFVMapInfo_BuildingF.html" target="_blank">
            <area id="Building_G" shape="poly" coords="" alt="Building G" href="UFVMapInfo_BuildingG.html" target="_blank">
            <area id="Building_H" shape="poly" coords="" alt="Building H" href="UFVMapInfo_BuildingH.html" target="_blank">
            <area id="Building_K" shape="poly" coords="" alt="Building K" href="UFVMapInfo_BuildingK.html" target="_blank">
            <area id="Building_S" shape="poly" coords="403,729, 426,729, 426,731, 466,731, 466,735, 481,744, 473,755, 473,819, 470,819, 470,825, 454,825, 454,820, 407,820, 407,767, 403,767, 403,756, 393,756, 394,744,
            <area id="Building_T" shape="poly" coords="" alt="Building T" href="UFVMapInfo_BuildingT.html" target="_blank">
        <!--Parking Lot Areas-->
            <area id="Parking_Lot_1_North" shape="poly" coords="" alt="Lot 1 North">
            <area id="Parking_Lot_1_South" shape="poly" coords="" alt="Lot 1 South">
            <area id="Parking_Lot_2" shape="poly" coords="" alt="Lot 2">
            <area id="Parking_Lot_2a" shape="poly" coords="" alt="Lot 2A">
            <area id="Parking_Lot_3a" shape="poly" coords="" alt="Lot 3A">
            <area id="Parking_Lot_3b" shape="poly" coords="" alt="Lot 3B">
            <area id="Parking_Lot_4" shape="poly" coords="" alt="Lot 4">
            <area id="Parking_Lot_5" shape="poly" coords="" alt="Lot 5">
            <area id="Parking_Lot_6a" shape="poly" coords="" alt="Lot 6A">
            <area id="Parking_Lot_6b" shape="poly" coords="" alt="Lot 6B">
            <area id="Parking_Lot_7" shape="poly" coords="" alt="Lot 7">
            <area id="Parking_Lot_8" shape="poly" coords="" alt="Lot 8">
            <area id="Parking_Lot_9" shape="poly" coords="" alt="Lot 9">
            <area id="Parking_Lot_10" shape="poly" coords="" alt="Lot 10">
            <area id="Parking_Lot_10b" shape="poly" coords="" alt="Lot 10b">
            <area id="Parking_Lot_12" shape="poly" coords="" alt="Lot 12">
        <!--Off Campus Building Areas-->
            <area id="Building_FH" shape="poly" coords="" alt="Building FH">
            <area id="Abbotsford_Sports_Complex" shape="poly" coords="" alt="Abbotsford Sports Complex" href="https://www.abbotsfordcentre.ca/" target="_blank">
        </map>
```

Elaboration: Coding the UFV Interactive Map



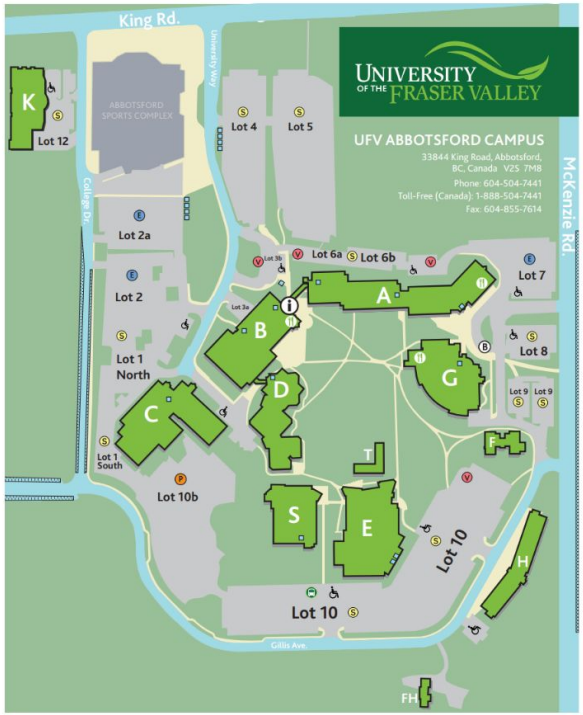
Elaboration: Coding the UFV Interactive Map

UFV Interactive Map

File | C:/Users/janni/Desktop/UFV%20Class%20Assignments/COMP%20371/Term%20Project/(2)%20Milestone/COMP371-UFVMAP/UFVMap.html

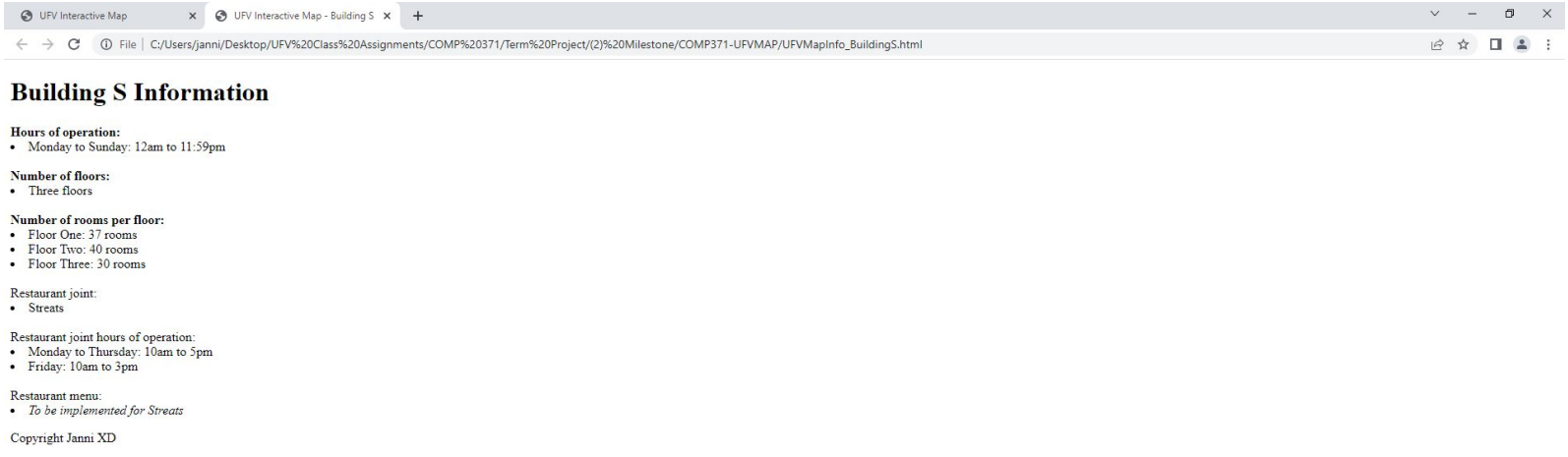
UFV Interactive Map

Click on the Buildings, Parking Lots, or Bus Stops for more information



C:/Users/janni/Desktop/UFV Class Assignments/COMP 371/Term Project/(2) Milestone/.../UFVMapInfo_BuildingS.html

Elaboration: Coding the UFV Interactive Map



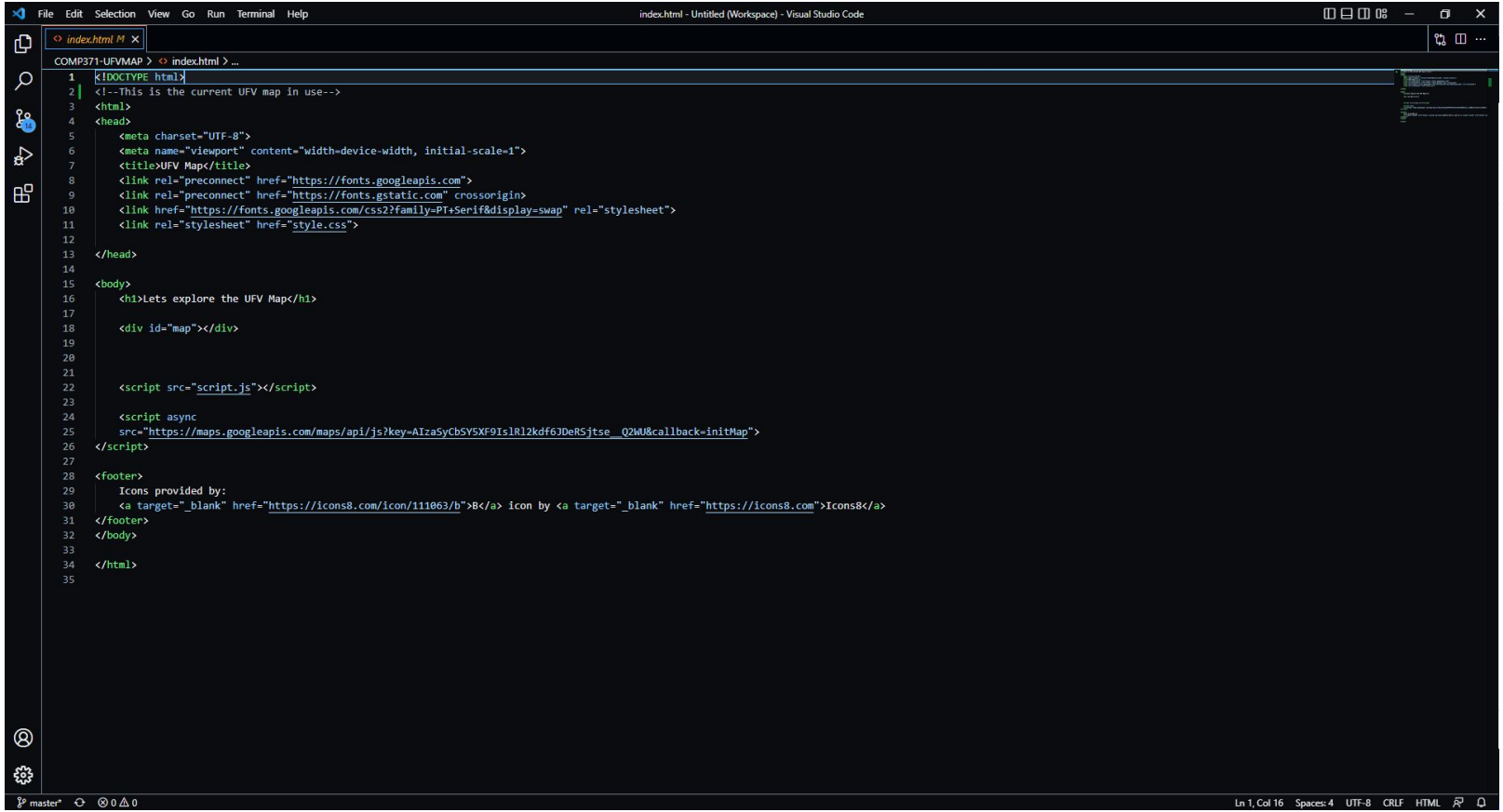
Elaboration: Coding the UFV Interactive Map

- Because the previous map was time consuming with finding pixel measurement values and did not allow the map to do what was originally proposed (without time spent coding in Javascript) another idea for the map was introduced by Naomi

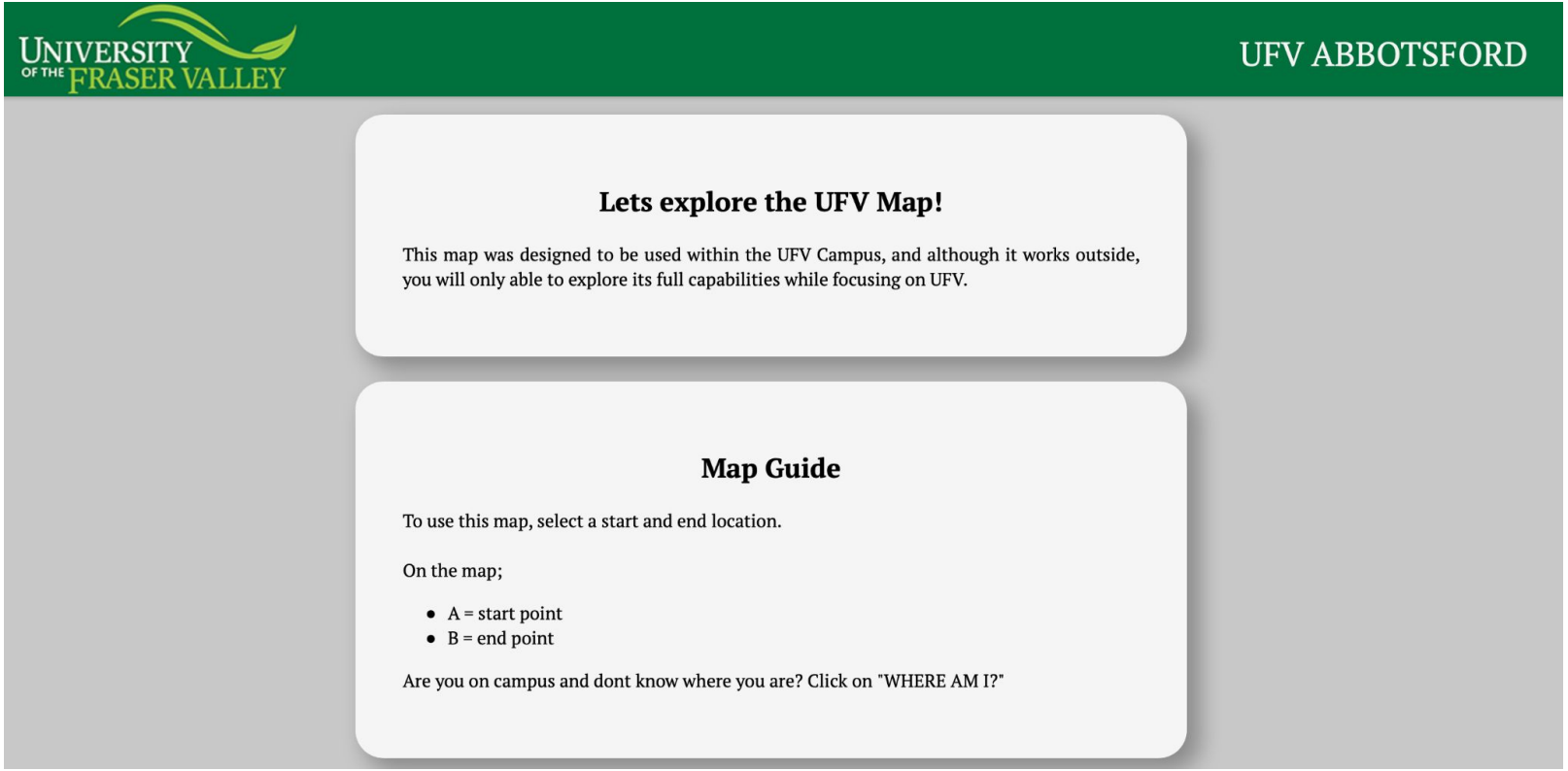
- Naomi created the map on the Google cloud platform. This platform allowed for the map to be styled using UFV colors and fonts and for the labels of each building to be cleared to simplify the look of the map.

- An API key and a map key were generated to allow the webpage to function

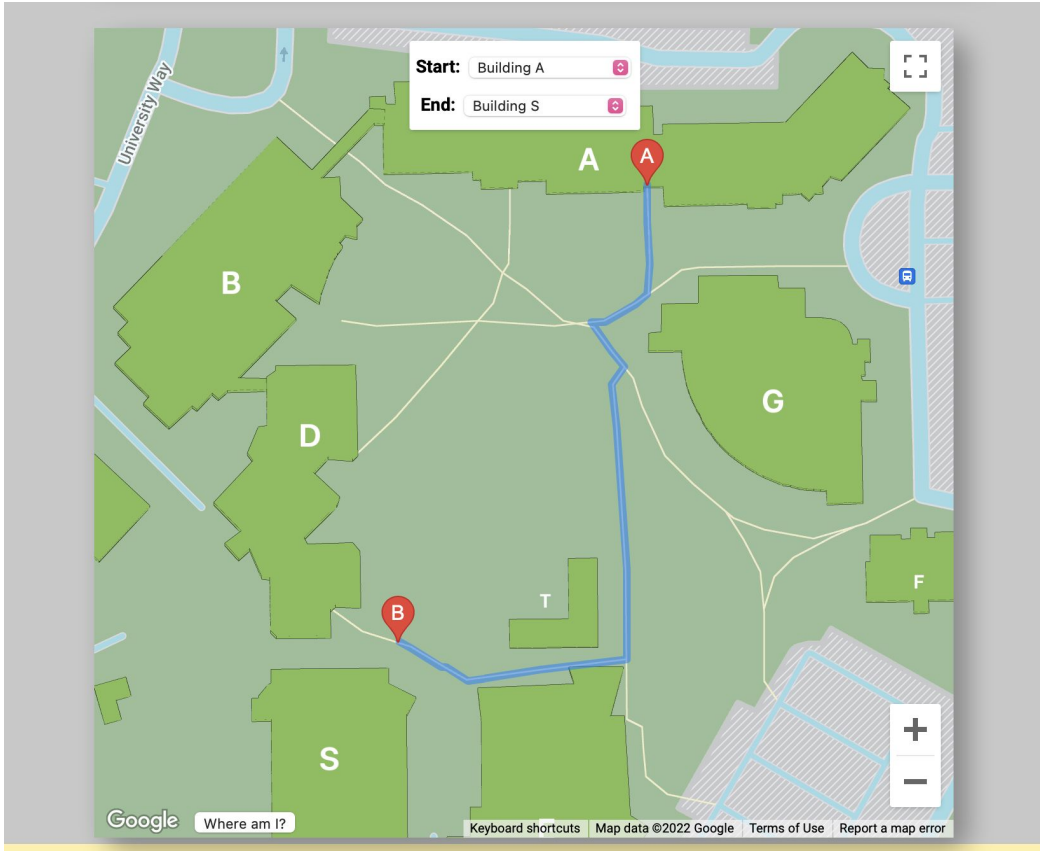
Elaboration: Coding the UFV Interactive Map



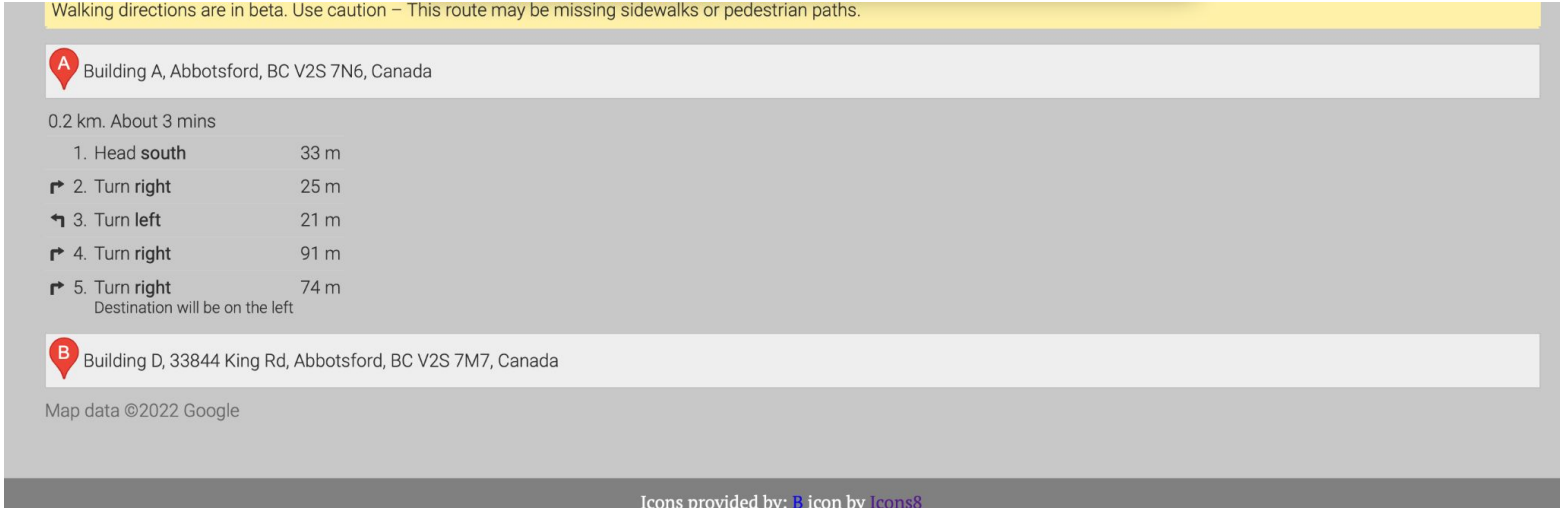
Elaboration: Coding the UFV Interactive Map



Elaboration: Coding the UFV Interactive Map



Elaboration: Coding the UFV Interactive Map

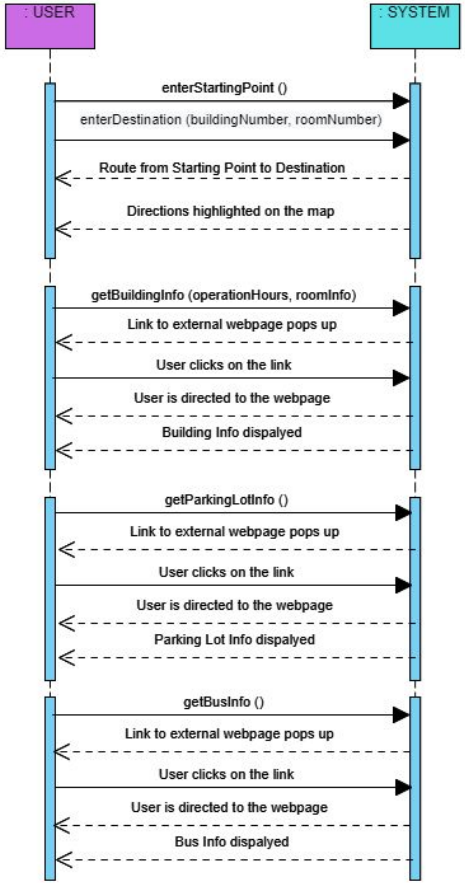


Elaboration: Adjustment with UML Diagrams

- As the coding proved to introduce problems, some of the UML diagrams needed to be changed to reflect changes in the project's structure based on the coding.

- Changes introduced may not have had an impact on all models created earlier in Elaboration

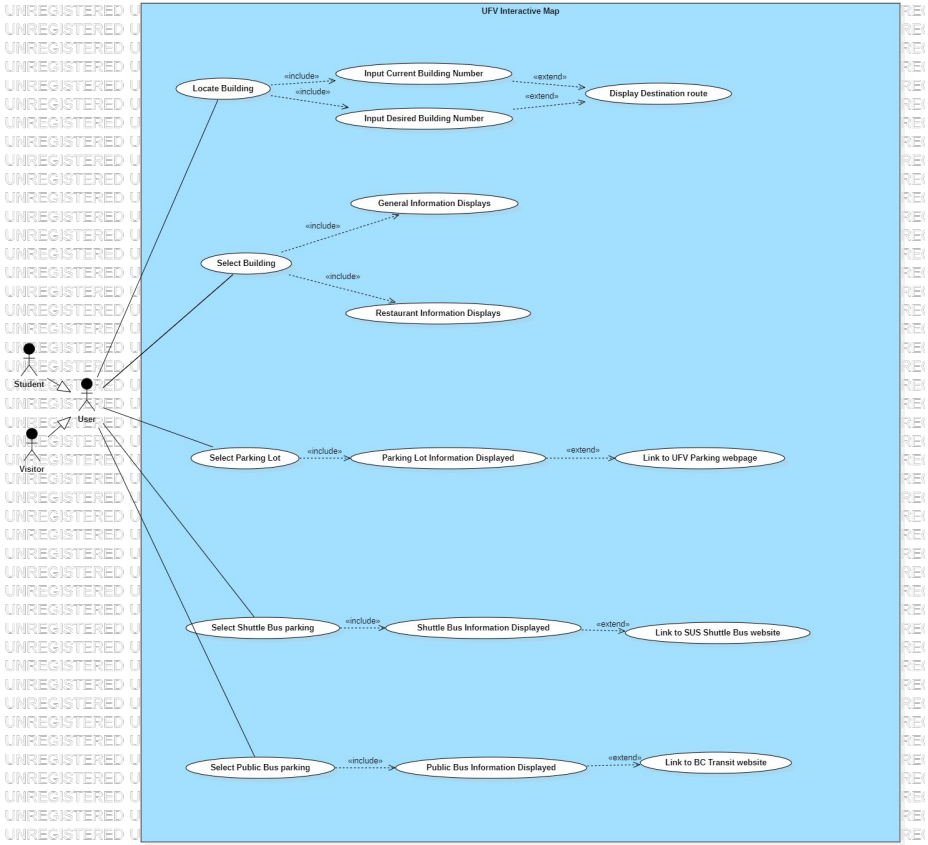
Elaboration: Adjusted System Sequence Diagram



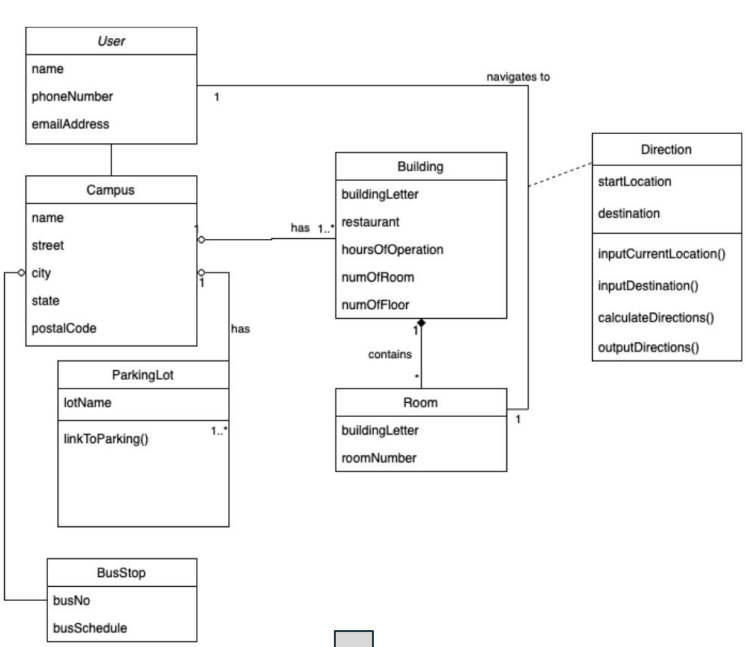
Elaboration: Adjusted Use Case Document

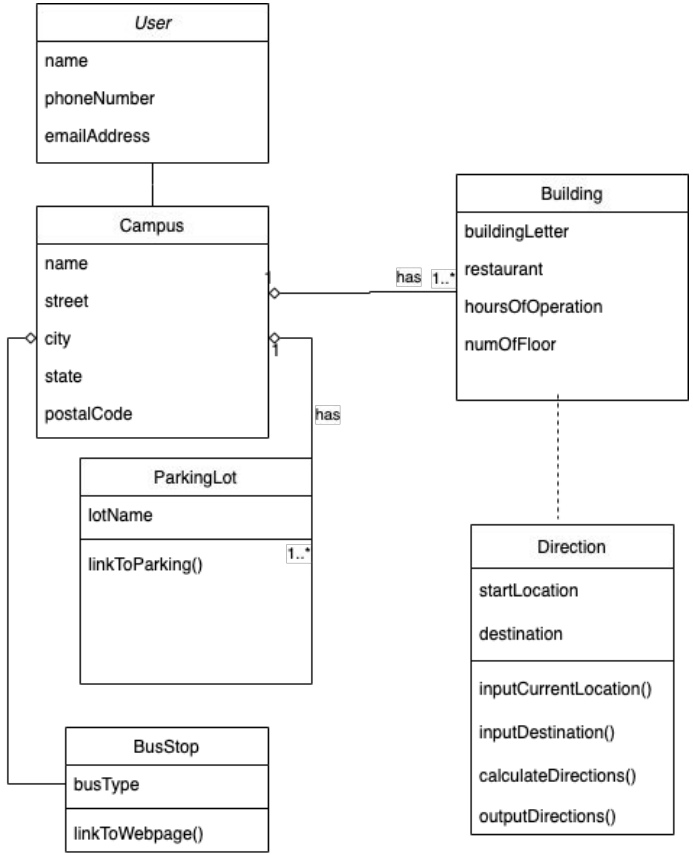
Use Case Title: UFV Interactive Map
Primary Actors: Student, Visitor
Level: User
Stakeholders: UFV President
Precondition: User looks up the UFV Abbotsford campus map
Minimal Guarentee: User is instructed to allow javascript
Success Guarentees: User can find building information, User is directed to specified buidling
Triggers: User clicks on "View Abbotsford Campus map"
Main Success Scenario 1. User inputs current buildling 2. User inputs building they wish to reach 3. Directions are generated from current building to desired building 4. Directions are highlighted on map
Extensions: 1. User selects building 1a. General Information is displayed about selected building 1aa. Building Letter 1ab. Number of floors 1ac. Number of rooms 1b. Information about a restaurant residing in the building is displayed 1ba. Name of restaurant 1bb. Hours of operation 1bc. Menu for restaurant 2. User selects parking lot 2a. Information is displayed about selected parking lot 2aa. How many stall numbers there are in the given parking lot 2ab. Link to UFV Parking webpage (https://ufv.ca/parking/) 3. User selects Shuttle Bus parking 3a. Information is displayed about the Shuttle Bus 3aa. Link to SUS Shuttle Bus website (https://ufvsus.ca/campus-shuttle) 4. User selects on Public Bus parking 4a. Information is displayed about the Public Bus 4ac. Link to BC Transit website for more information (https://transitfeeds.com/p/bc-transit/686/latest/stop/107190)

Elaboration: Adjusted Use Case Diagram



Elaboration: Adjusted Domain Model





Issues faced during project

- Restricting the map only to UFV Abbotsford campus.
- Restricting the user input to only UFV buildings.
- Providing directions to room in the building.

Prototype

- Now that we have reached the end of the semester, a prototype has been created to display the basic features of the UFV Interactive Map

End of Presentation

Thank you for watching!