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Dr. Pulimood

CSC 415-01: Software Engineering

## Open Source Software: Proposal and Specifications

### **The social issue:**

This mobile app would focus on low-income housing for TCNJ students or individuals around the Ewing/Trenton area who are no longer supported by others. The app would be a stream-lined way for people looking for affordable housing in their area of interest, all within a price range that they can afford. In addition, I would like this app to emphasize an aspect that would allow those transitioning or non-binary individuals who seek gender-inclusive housing. On the app, they can find areas in which there are LGBTQ+ communities or places/houses they can rent without feeling uncomfortable with their identities.

**The project title:** Gender Inclusive Housing for Low-Income Individuals

**Option 1 or 2:** Option 2 was chosen.

“OPTION 2: Based on the class and small group discussions, consider a social issue that interests you. Propose your own project to design and implement an innovative computational solution to the social issue you identified.”

**Web-based or Mobile application:** Mobile Application

This would be a mobile application in iOS. The app would be built using the language “Swift”. A safe, friendly, fast and interactive programming language to build iOS applications. Swift programming language has been developed by Apple for iOS, macOS, watchOS, tvOS, and for Linux as well. You can only download and install swift for Linux platform. Swift is available as a part of Xcode (an integrated development environment for macOS).

### **The project idea:**

To build an iOS application where low-income individuals in the Ewing/Trenton area can locate gender inclusive housing nearby.

### **Why the project is innovative | How will it help address the social issue:**

The project will help address the social issue in a way that there is currently very few or no mobile applications at all regarding gender inclusive housing for low income students. Additionally, this app is innovative as it will allow those transitioning or non-binary individuals to seek for gender-inclusive housing. On the app, they can find areas in which there are LGBTQ+ communities or places/houses they can rent without feeling uncomfortable with their identities. This idea has yet to be implemented in Trenton/Ewing areas, making the project new and innovative.

### **The Algorithm(s) that will be Used:**

- Either Quicksort/Mergesort will be used to sort out the houses.
- Brute force algorithm
  - o Satisficing: stopping as soon as a solution is found that is good enough
- Either Sequential search/Binary search to search for houses within the range (miles)
  - o Sequential/linear: scans one item at a time
  - o Binary: cut down the search to half as soon as the middle element is found in a sorted list

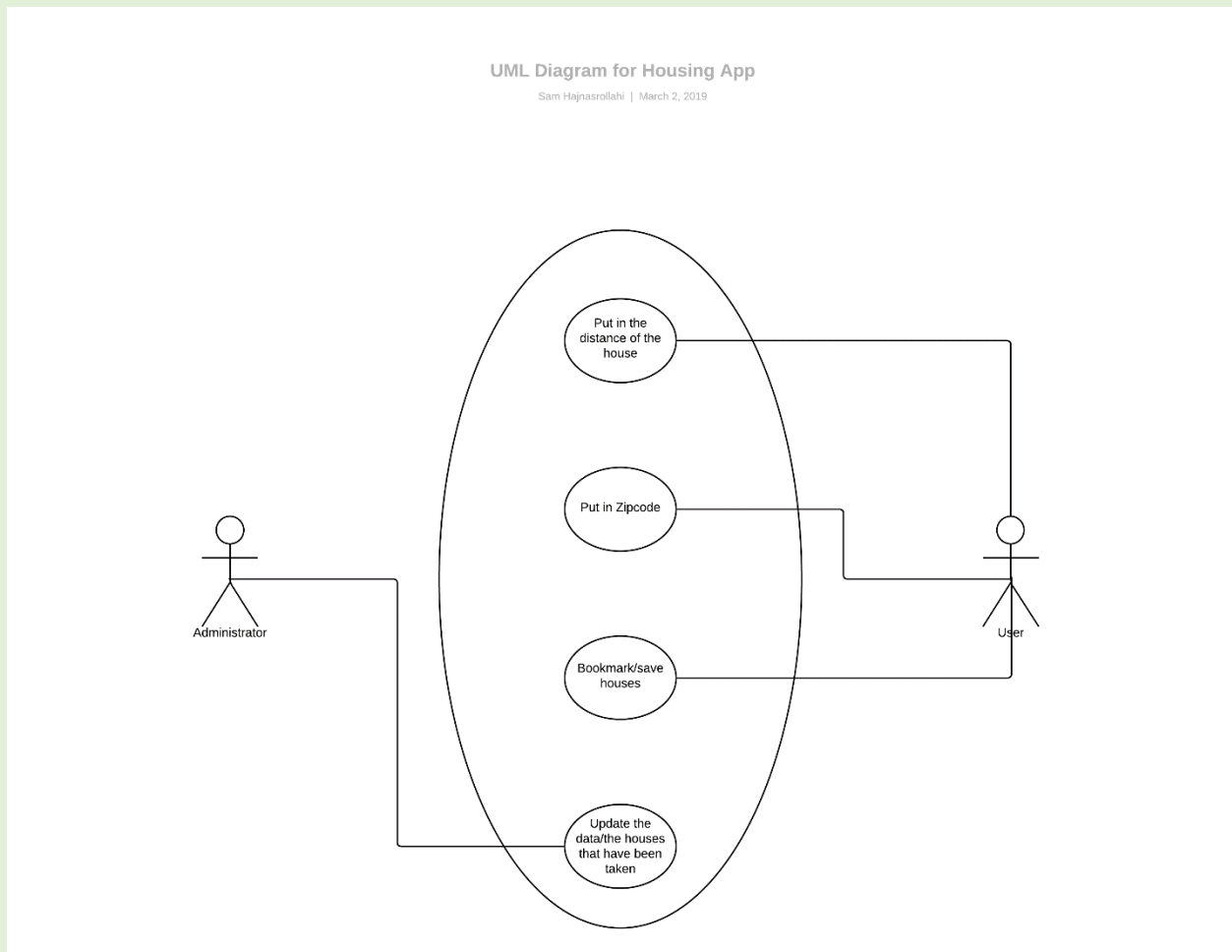
### **The data structure(s) that will be used:**

- Arrays: collection of elements, each identified by an array index, to store in the houses
- Linked list: data elements are not stored at contiguous locations. It also doesn't have a fixed size which would be good for this app as you would never know how much data there would be/how many houses there would be.
- A hash table might be used so mapping keys to values would be possible. This way the program could have keys pointing to different houses.

### **New Software Engineering Concepts to be Learned/Reinforced:**

- Hashing would be a concept to reinforce as it is an important topic for Software Engineers to know.
  - o With hashing, accessing data is very fast, look-up time is constant
- Object Oriented Programming
  - o Make good use of classes, functions and methods
  - o Make good use of Object-Oriented programming concepts such as:
    - Inheritance
    - Encapsulation
    - Abstraction
    - Polymorphism

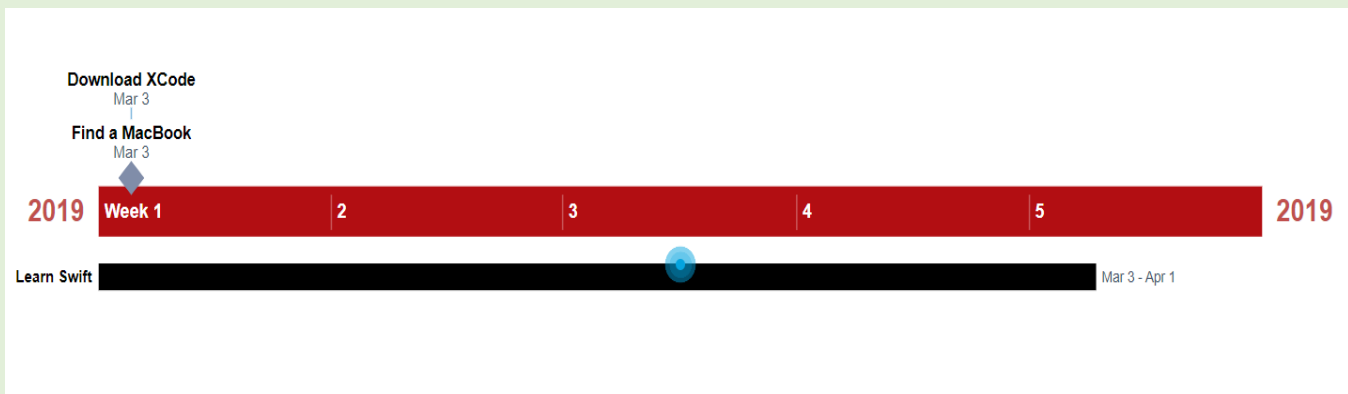
## Use Case Diagram:



## A Timeline

- Learning Swift:
  - o Sources:
    - <https://codewithchris.com/learn-swift/>
    - <https://www.udacity.com/course/intro-to-ios-app-development-with-swift--ud585>
    - iOS app on phone called “Code Swift”
- How long will it take to learn the language: approximately 2-3 weeks.
  - o This includes getting familiar with the XCode environment
  - o It will be my first time ever learning swift, which is why I predicted around 2 to 3 weeks of preparation/learning

## Timeline of learning Swift:



**Name of Repository on GitHub:** Homebody

<https://github.com/samihn/Homebody.git>

Path: <https://github.com/samihn/Homebody> (samihn/Homebody)