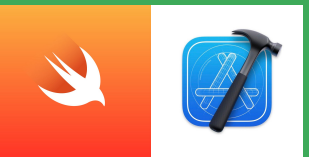
TreeTracker

CIS 4360 (Computing For Social Good)
Team Members: Shiv Patel, Nicholas Coffin



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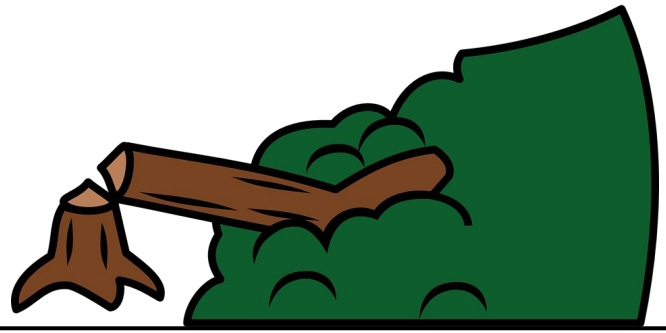

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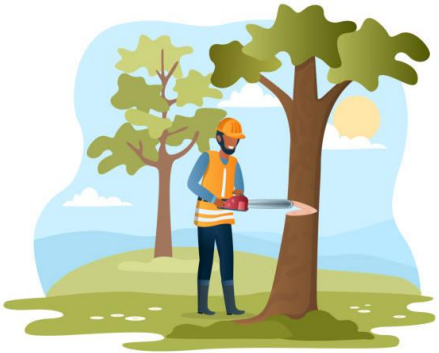


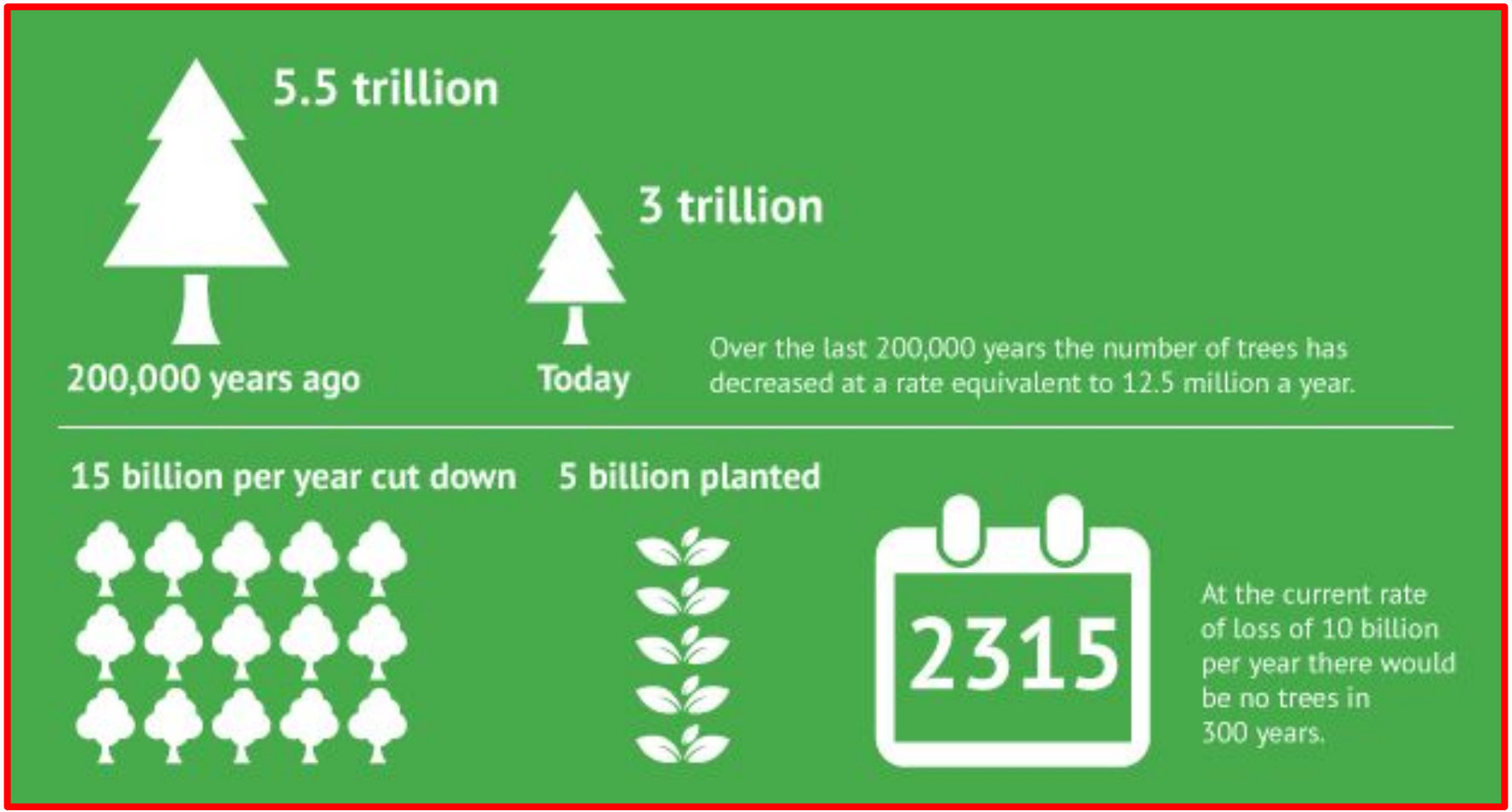
- There are ~3.04 trillion trees on Earth.
- If we do the math…
  ~(3 trillion / 15 billion) = 200

  …
- This means, at the current rate trees are being cut, in 200 years, there will be none left

Luckily…trees are being planted by charities and other organizations

~5 billion new trees are planted yearly!

a few examples of tree planting charities are shown above



Source: https://www.irishtimes.com/news/science/planet-s-total-tree-cover-down-46-since-arrival-of-humans-1.2337785

Why are trees important? Why should people even care?

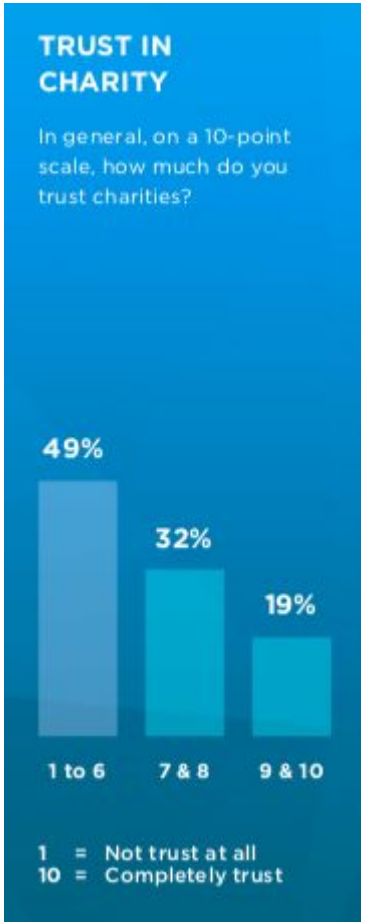
Saving trees is a critical social good issue. Trees provide a variety of benefits for humans, including (but not limited to):

1. Trees improve air quality and allow for cleaner air.
2. Trees improve drinking water quality and reduce flooding.
3. Trees are proven to reduce stress in humans and promote good health.
4. Trees create a habitat for animals.
5. Trees reduce human crime. A 10% increase in trees resulted in a 12% decrease in crime one study found.

https://www.nwf.org/Trees-for-Wildlife/About/Trees-Make-a-Difference

Project Introduction

- In order to boost tree planting, we wanted to create an application that allows a user to donate money to a tree planting charity and, in return, be given the location of where the tree got planted.
- This will motivate more people to donate money if they see their contributions are going towards something real and meaningful.



Why TreeTracker Works

Many people do not trust charities.

According to a study by BBB Wise Giving Alliance, only 19% of Americans 'highly trust' charities. That's less than 1 in 5!

A big reason for this lack of trust is that no one knows where their money is *really* going. 73% of people in the study think it's important to highly trust charities before donating.

If we can show trees are actually being planted, more people will trust these organizations.

Image: BBB Wise Giving Alliance's survey findings of US adults

Quick Example

While doing research about Arbor Day Foundation, an organization that plants trees, we found that one of the most commonly searched questions was:

This is just one example that highlights the lack of trust people have.

Tree Planting Tracker

My idea is to create an application that tracks donations you make to tree planting charities and gives you information on the projects your money was used for. Instead of just donating and seeing the money disappear, doners will now be able to see exactly where, when, what, and how their money is being used to plant trees and reforest our world. This would give doners more of a sense that they're making a difference and will hopefully spur more donations and therefore more trees planted. One of the best ways we have of fighting climate change is planting trees so this will hopefully make a positive impact on the world.

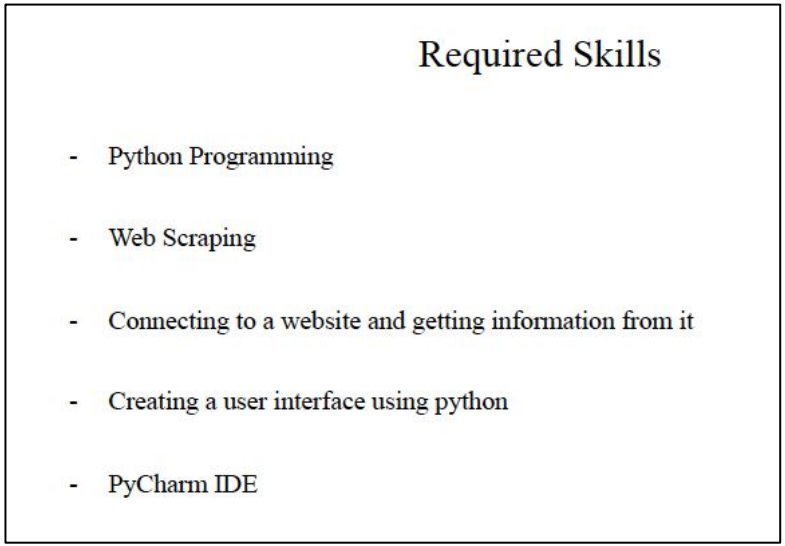
Component 0 & 1

Shown on the left was Nick's initial idea.

We will use technology to address this issue by creating an application that promotes trust in charities thus boosting tree planting as a result.

In terms of Rediet Abebe's roles of computing for social justice, this project would best be understood as a synecdoche. Planting more trees and reducing tree cutting has been a social good topic for a long time, however utilizing technology with a focus on charity trust is a newer and more innovative approach.

Component 2: Draft Proposal



Early in the project, we wanted to show users where their money went by showing the location of where their specific tree got planted, along with what type of tree. We wanted it to be personable and relatable for our users.

Component 3: Group Proposal

In component 3, we made a general plan to follow. However, this is slightly irrelevant now as we modified our project idea.

- There are two big steps in this project, the first is figuring out how to web scrape data, and the second is creating a UI that is simple for the user to understand.
- Some milestones we decided on include: figuring out common tree planting charities, figuring out what libraries are needed for web scraping and creating a user interface, figuring out what user input will be needed, and then actually creating the application itself.

Component 4: Project Design Specification and Evaluation

Layer 1/Functional Minimum: A platform where the user can put some input and get some fixed information from a website. The websites include Arbor Day Foundation, One Tree Planted, and American Forests. This information will include where they have recently planted trees and where they will plant trees in the future.

Layer2/Low Target: A platform where the user can put in some input and then decide what information they want from the website. The different information can include where they have recently planted trees, where they will plant trees in the future, projects they're currently working on, and other specific information from the website.

Component 4: Continued

Layer 3/Desirable Target: A platform where the user can put some input and get information from lots of different websites from organizations that plant trees. This program will display a list in the beginning of all the different available websites and will be able to get variable information from each of them.

Layer 4/High Target: A platform where the user can enter any website they want, and the system will determine whether or not it's a tree planting organization. The system will then give them any information they want from the website.

Component 5: Intermediate Prototype Presentation

Initial Project Idea: Our project was going to be a tree planting tracker where whenever you donate to a nonprofit tree planting company, such as the Arbor Day Foundation it tells you where and what kind of trees were planted with your money. The goal was to create a platform where the user can enter any website they want, and the system will determine whether or not it’s a tree planting organization. The system will then tell the user what kind of trees were planted with their donation, and where they were planted.

What we decided to go with...

Our biggest difficulties in this project while building our first prototype attempt were:

- Our choice in programming language (Python)
- Lack of tree planting location data from charities

We decided to tweak our initial project idea by:

- Designing a mobile app instead. We wanted to target a larger audience and found that ~80% of the world owns a smartphone. Additionally, In the past year, mobile donations have increased 205%.
- Instead of finding where individual trees got planted, we decided to show a general map of the impact every donation has. This was done using Global Forest Watch's interactive forest map, which is a free online tool that shows tree losses and gains.

Component 6

Final Project Implementation:
We used Swift and Xcode to create an iOS application with a clean and user-friendly interface.

We broke this new goal into 3 new steps:

1) Design the app's UX using tools such as Swift, Adobe XD, and InVision
2) Using Xcode, add in screens and use Swift for user data
3) Test and see if our app works

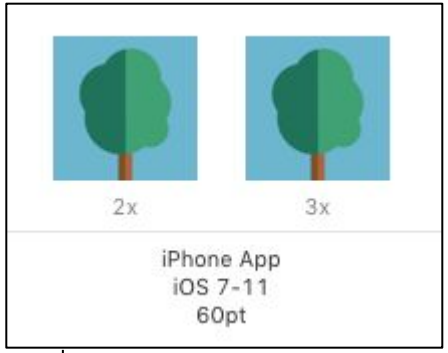
Project Implementation (Continued)

Additionally, we learned while doing research that Gen Z (those born between 1997 and 2007) are more willing to donate than other generations! 87% of Gen Z also happens to play video games weekly, so we decided it would be fun to add a leaderboard of whoever donates the most.

Instead of explaining what the app does, let us show you…

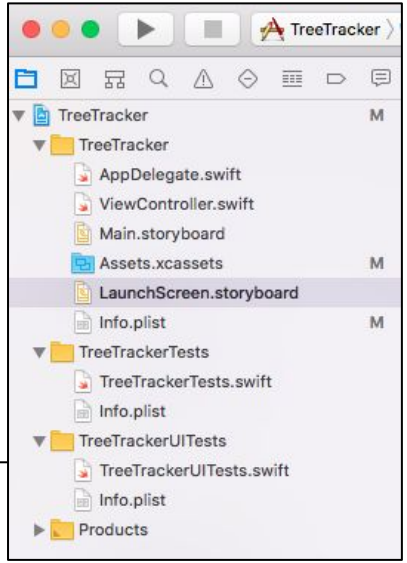
Behold...our final project!

1. Built for iOS 11.4 (works on both iPhone and iPad)
2. Focus: Simple and easy to navigate

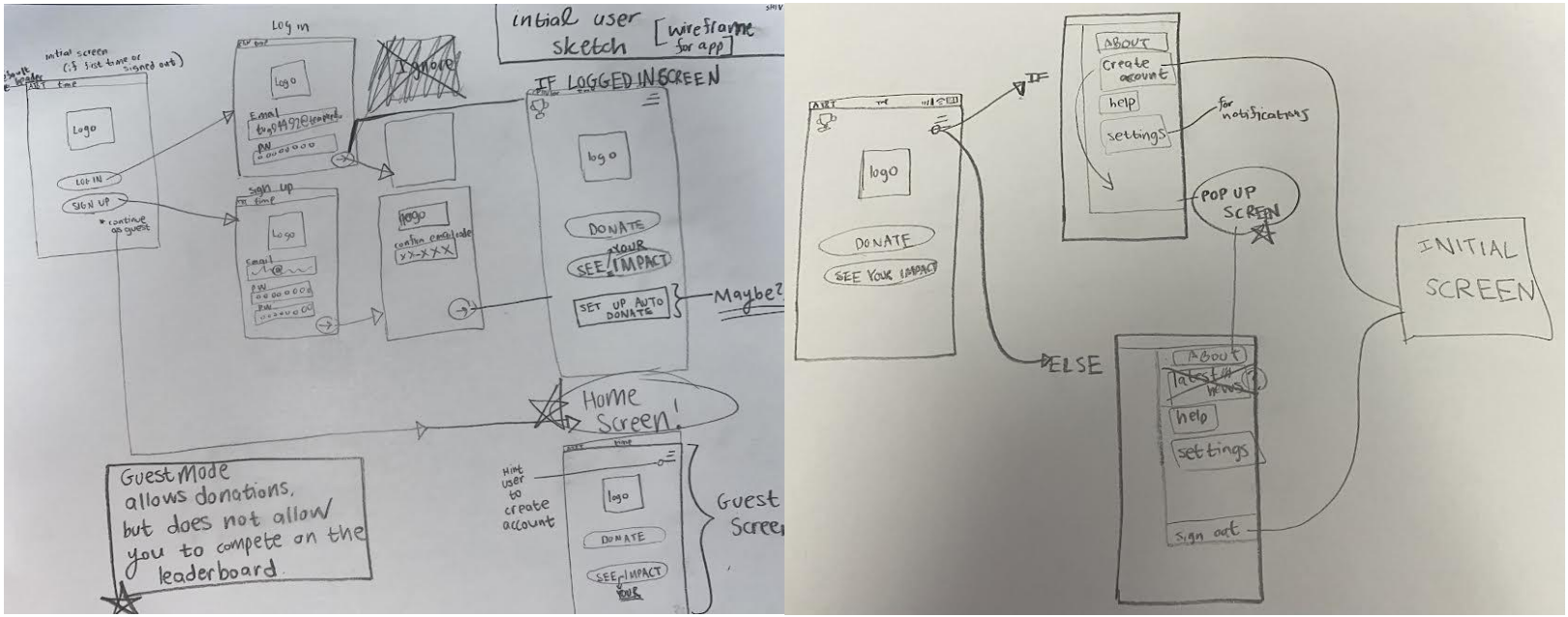


App Icon Design (designed using Adobe XD tool)
Assets.xcassets

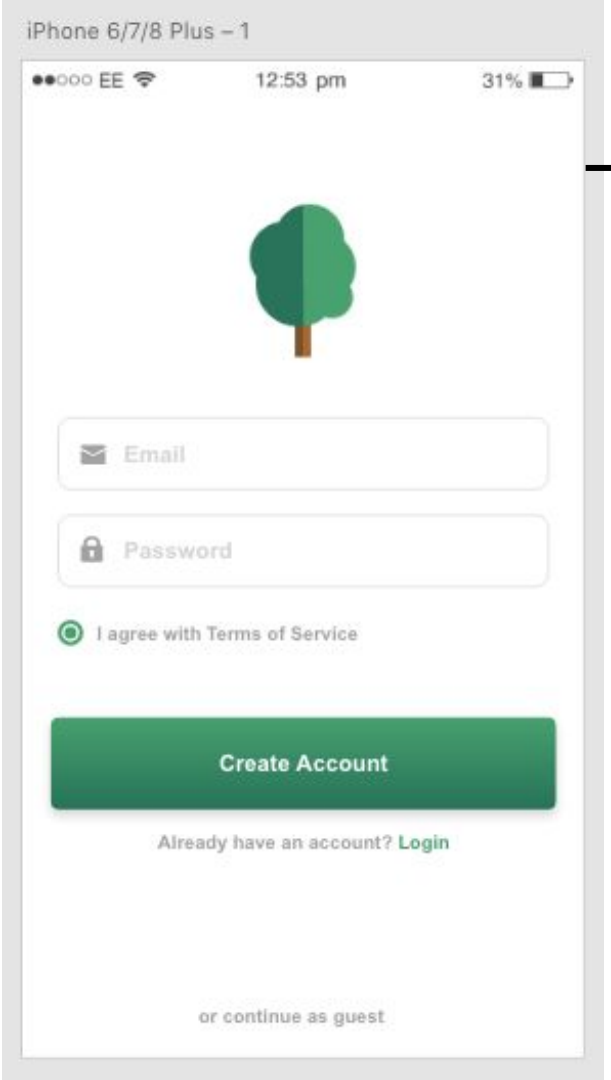
Swift Files



App Wireframe (Pencil & Paper)

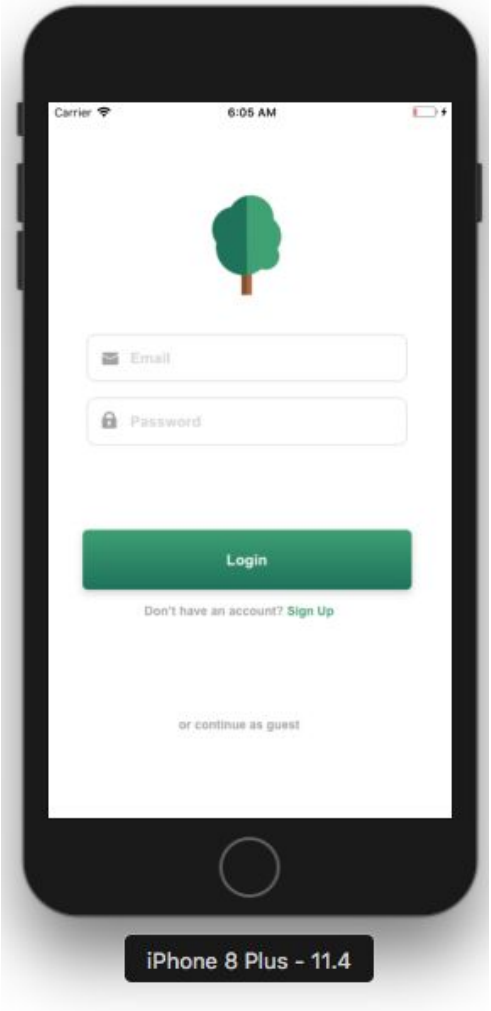


quick sketch on paper to see the general idea and flow of the app



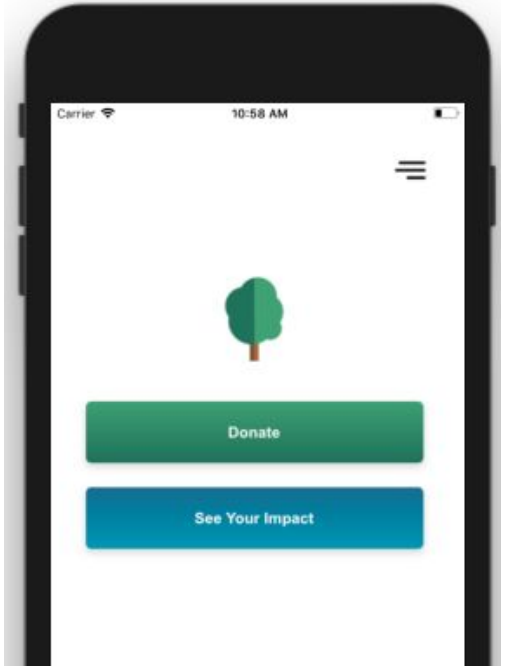
shown here is the initial default screen

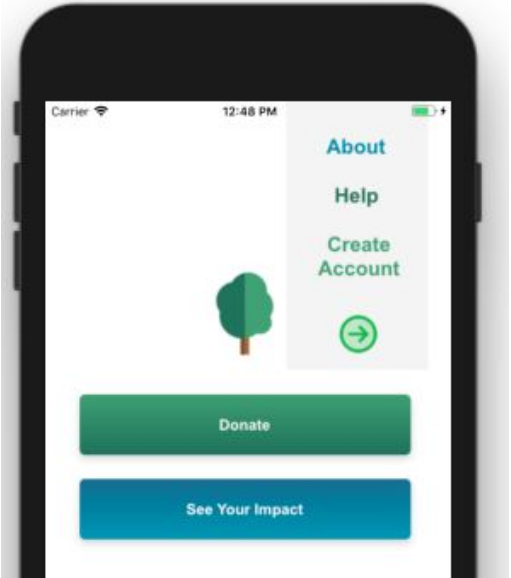
We used Adobe XD tool to add visuals to the wireframe and confirm design.



Later, we were able to build in Xcode directly. I created a splash screen in the LaunchScreen.storyboard file. I continued the rest of the app in Main.storyboard and AppDelegate.swift

Sample size storyboard of TreeTracker





About Screen

Donate Screen

See Your Impact Screens

TreeTracker was created by Shiv and Nick for a college course called 'Computing For Social Good'.

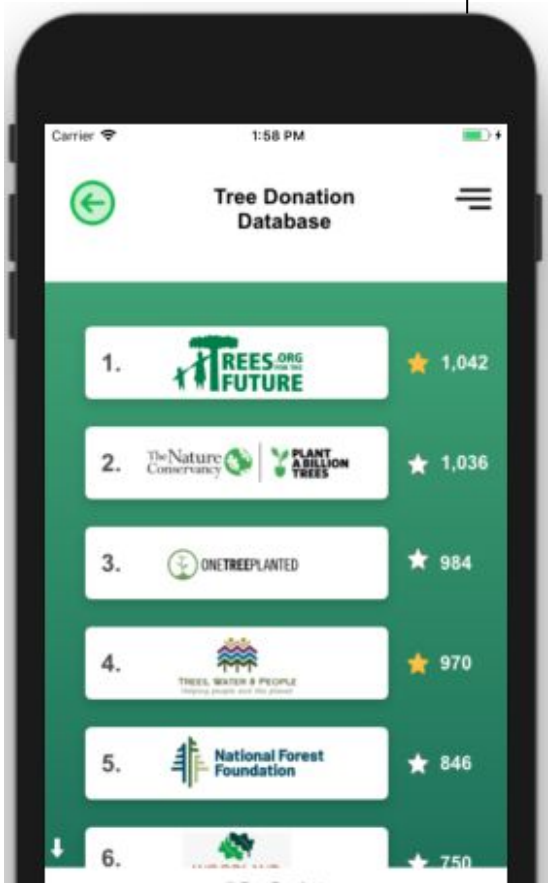
With worsening climate change and 15 billion trees getting cut down yearly, we wanted to remind people why donating to help save the trees is important.

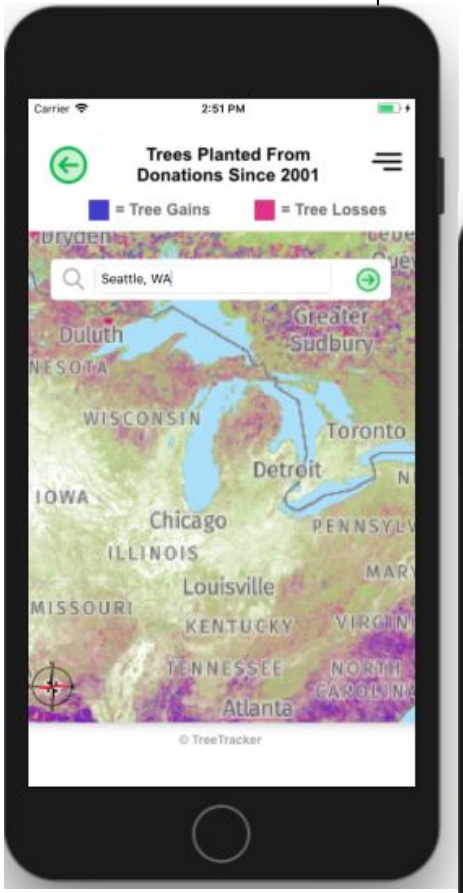
At the current rate, in 300 years, there won't be any trees left. Trees provide so many benefits, such as cleaning our air and water, as well as reducing human crime and providing a habitat for our world's animals.

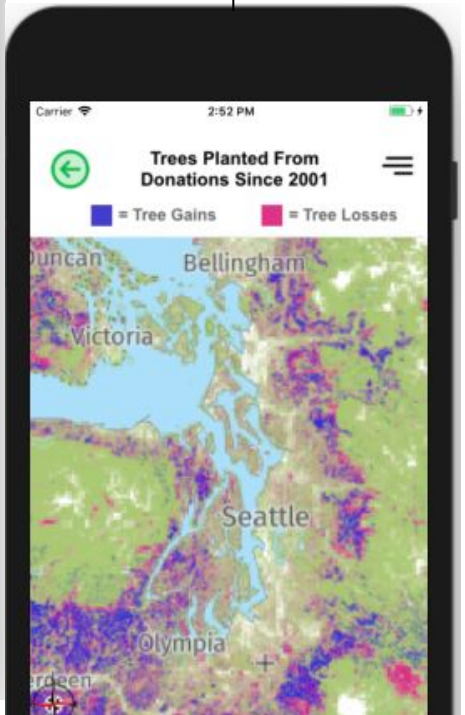
To use TreeTracker, first begin by creating an account or by using our guest mode. Hit the 'Donate' button to see the various trustworthy tree planting charities. Vote on your favorite by starring it!

Check out the 'See Your Impact' button and view the affect every dollar donated has on our beautiful planet.

We appreciate you using our app and thank you for your contributions.







TreeTracker Final Thoughts

Things missing – email authentication, cross-platform ability, retaining user information on an account to implement a leaderboard system (not enough Swift experience and time), maybe a chat system to talk with other users?

If possible, it would be nice to contact charities for data to implement our original tree tracking idea as a feature in this app. Overall, we learned a lot about iOS app development and are proud of what we accomplished within the time span. We believe this idea would benefit everyone and promotes social good.

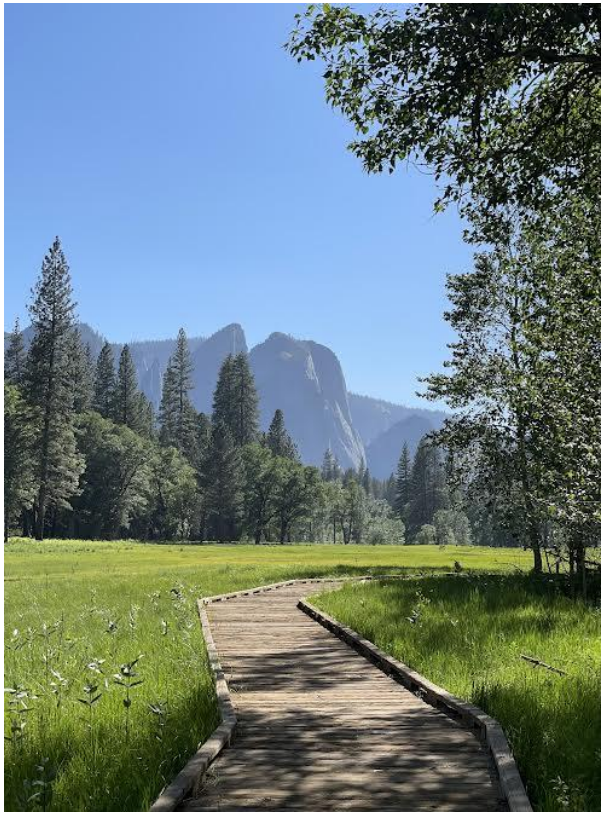


Photo was taken in Yosemite National Park by Shiv.

Thank you for listening to our presentation.

Research Citations (MLA8)

"2018 Online Giving Statistics, Trends & Data: The Ultimate List of Giving Stats." *Nonprofits Source*, nonprofitssource.com/online-giving-statistics/.

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Image Source Links (Credit to Artists)

Tree Cutting: https://www.istockphoto.com/vector/male-character-in-workwear-cutting-tree-with-a-chainsaw-gm1306526998-397083953

Tree Hugging: https://www.birchtreecare.com/blog/give-your-tree-a-hug-its-good-for-you

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Python Graphic: https://www.bairesdev.com/technologies/why-use-python/

Cross-Platform: https://www.sam-solutions.com/blog/cross-platform-mobile-development/

Swift & Xcode: Apple