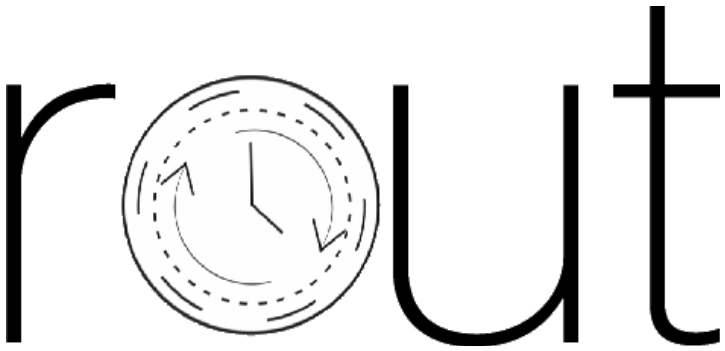

Team 17 - Product Backlog

Steven Bass, Luke Irons, Logan Sweeney, William White, Austin Wilson

Problem Statement:

While Google Maps, Under Armour, and other applications do allow for navigation from point A to point B, they do not calculate efficient routes from point A back to point A. Additionally, many of these apps require users to create an account and limit the number of free route users may generate.

Rout allows users to find new routes for running, biking, or even just walking freely with no limit and no need to make an account. Users can prioritize routes based on distance, time, or hazards, and save favorite routes for future use as well as obtain information and data about their past routes. Rout also offers real-time information on relevant outdoor conditions, like weather or temperature, and expected time of completion.

Background Info:

Audience

Even with the advancements that have been made in modern mapping technologies (Google Maps, Apple Maps, etc), there is no application that allows users to choose randomly generated routes based on factors such as distance, time, hazards, etc. Runners, bikers, walkers, and others looking for exercise must settle for creating routes themselves or using a less-than-ideal application that cannot fill all of their needs.

Similar Platforms

Currently, there are multiple different route planners available through platforms such as IOS with the Map my Route Under Armour App and web based applications such as plotaroute.com and maps.ie/map-my-route/. The Under Armour app in particular functions similar to Rout but does not automatically plot routes for you unless already saved by another user of the app. Plotaroute and maps.ie also allows users to plot routes but place a greater emphasis on tracking mileage from a pre-established route.

Limitations

The main drawback of the mentioned platforms is that it requires users to create and sign in to an account to have the platform create a fully automatic route for its users. This causes unneeded work and time for users looking to create running or walking paths quickly.

To address this problem we plan to decouple the ability to have automatically generated routes with the need for creation and sign in of accounts for the ease of use for our users.

Functional Requirements:

1. As a user, I would like to find a new route without needing an account.
2. As a user, I would like to register a new Rout account.
3. As a user, I would like to login to my Rout account.
4. As a user, I would like to logout of my Rout account.
5. As a user, I would like to be able to reset my password through email.
6. As a user, I would like to be able to reset my password through SMS.
7. As a user, I would like to be able to secure my account with 2 factor email authentication.
8. As a user, I would like to be able to secure my account with 2 factor SMS authentication.
9. As a user, I would like to be able to customize my nickname on my profile.
10. As a user, I would like to be able to customize my profile with a profile picture.
11. As a user, I would like the UI of the website to be easily understood and used.
12. As a user, I would like a brief tutorial on the UI the first time I use the application.
13. As a user, I would like to adjust the color of the UI to dark mode.
14. As a user, I would like the website to have a visually appealing color palette.
15. As a user, I would like to be able to adjust default measurements between Miles/Kilometers.
16. As a user, I would like to save a route for future use.
17. As a user, I would like to view and use saved routes.
18. As a user, I would like to be able to export saved routes as a file for sharing purposes.
19. As a user, I would like to be able to share routes with other users through a URL.
20. As a user, I would like to be able to rate a route following its completion.
21. As a user, I would like to have a UI element to customize what type of route I am looking for.
22. As a user, I would like to find multiple routes from the same starting point.
23. As a user, I would like to find a route using distance.
24. As a user, I would like to find a route using time and a pace.
25. As a user, I would like to see how many calories I've burned after taking a route.
26. As a user, I would like to be able to visualize the amount of calories I've burned.
27. As a user, I would like to view my total calories burned over all routes I've taken.
28. As a user, I would like the information and statistics of previous routes to be stored.
29. As a user, I would like to find a route by hilliness.
30. As a user, I would like a "difficulty score" based on the intensity of my route.
31. As a user, I would like to find a route only on sidewalks.
32. As a user, I would like to plot routes with specific waypoints to pass through.
33. As a user, I would like for outside temperature to be displayed in the route planning screen.
34. As a user, I would like for outside weather conditions (rain, snow, etc) to be displayed in the route planning screen.

35. As a user, I would like for date/time information to be displayed in the route planning screen.
36. As a user, I would like to be able to share my routes through popular social media services (Facebook, Twitter, Instagram).
37. As a user, I would like to track my progress along a route in real time via GPS.
38. As a user, I would like to know the pace of the previous route.
39. As a user, I would like to compare my pace with distances similar to those ran by famous or olympic runners.
40. As a user, I would like to drop a pin to use as a start point.
41. As a user, I would like to use an address as a start point.
42. As a user, I would like to have autocomplete when typing an address.
43. As a user, I would like to be able to see important turning points on my route through Google 360° Street View.
44. As a developer, I would like administrator accounts which give access to backend data.
45. As a developer, I would like to be able to edit user information within the database.
46. As a developer, I would like a MySQL database for storing account information.
47. As a developer, I would like to implement a pathfinding algorithm which uses the Google Maps Directions API.
48. As a developer, I would like the pathfinding algorithm to run in polynomial time.
49. As a developer, I would like to use the Google Maps API to create possible routes.
50. As a developer, I would like a Javascript framework for making calls to the Google Maps API.
51. As a developer, I would like to be able to view usage metrics of Rout.
52. As a developer, I would like to be able to push changes to the UI without taking down the site for management.

Non-Functional Requirements:

Architecture and Performance
Our goal is to separate work between frontend (JS React) and backend (mySQL, Javascript, Google maps API). The frontend will be focused on developing a simple UI with the least amount of distractions possible to increase ease of access for users. The backend will be divided in two parts. One portion will be to make a database with easily retrievable information for saved routes and user information. This should be able to support upwards of 10,000 users' data with the space provided, and should take at most 500ms to respond to a user request. The other portion of the backend will be for using the Google Maps API and users' data to produce routes. This portion should take no longer than one full second to respond with a completed route. User throughput on this system should not be an issue, given that Google's services support large volumes and most calculation overhead will be passed to the client. Our goal with the pathfinding algorithm is to allow users to find routes quickly, so the shorter the runtime the better.

Security
Security is of paramount importance as User information (login info, names, previous routes) will be stored in the SQL database. Our goal is to have separate user and administration accounts so that admins can access relevant data and change user information but users are blocked from similar activities. We will also work towards implementing security features to prevent malicious parties from compromising the database through scripting or injection.

Usability
The user interface should be simple to understand and navigate, and it should not take a user long to learn how to use the application. Having a clear UI is especially important considering that users will be taking their routes directly from the application, and any unclear navigation could result in the user moving off-route, which defeats the purpose of the application.

Hosting/Deployment
The frontend will be deployed to a GitHub Pages site which is tied to the development GitHub repository. The backend services will be hosted on a free tier Amazon Web Services cloud server.