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CS 447 - I3

Project Topic

My group's project topic is to gain insights and feedback from college-age students with dietary and allergy restrictions about their dietary preferences and any challenges they may face when trying to find suitable food. We want to gain a detailed understanding of how these students make food decisions every day when eating on and/or off campus and to use this information to design a product or find a solution that locates safe food locations and provides alternatives to their food restrictions. Our project is aimed at solving the discomfort and challenges college-age students face when trying to find suitable food in their community.

Investigating the Solution Space

One solution that informs customers of potential dietary restrictions/allergies and attempts to safeguard them from having allergic reactions is a restaurant providing food allergy warnings. Food allergy warnings can be found in any restaurant on their menu although it is up to the restaurant whether to include them. Food allergy warnings are intended to prevent customers with food allergies and dietary restrictions from eating something they cannot, and they allow those customers to make an informed decision about what kind of suitable food to eat. Food allergy warnings are written on restaurant menus usually and can consist of different variations; a restaurant could put a warning on their menu that states what kind of allergens their food might come in contact with. A restaurant may also provide an ingredient list for each menu item or have indicator symbols next to each menu item to indicate potential allergens or whether a menu item is free of allergens (GF, for example, indicates the menu item is gluten-free). The

biggest limitation of this solution is that it is entirely up to a restaurant whether to include this information on its menu; the customer has no control over this decision and could end up in a restaurant that does not include any information about potential allergens. The customer also has no way of knowing whether a food location includes allergen information or not until they physically go there unless there is an online menu with that information.

A second solution to protecting customers from food allergies and dietary restrictions is for a food location to use dedicated areas and equipment designed for food-allergic customers. This solution can be found in any food location and is up to any given location whether to implement it or not. The solution protects allergic customers from coming into contact with what they cannot eat and ultimately keeps them safe from having an allergic or some other adverse reaction. A restaurant can implement this solution by having a separate area to prepare food for allergic customers and using two separate sets of equipment. This allows the kitchen to prevent allergens from coming into contact with food that should be allergen-free. It also addresses storage concerns of different ingredients that may result in cross-contamination with allergen-free food. Some limitations of this solution are the customer has no control over whether a food location implements the solution or not, and this solution doesn't allow a customer to make an informed decision directly about what kind of food to eat; it only acts as an additional safety measure.

A third solution to allowing users to find suitable food based on their dietary and allergy restrictions is a mobile app named Spokin. Spokin can be found in the Apple Store and downloaded by any iPhone user. This app allows its users to find restaurants, bakeries, or ice cream parlors where they can safely eat with their dietary restrictions. All users must first create a profile with the foods they cannot eat and the app will then show them a detailed map of

suitable and safe food locations around them. The app is great for navigating new areas where one might be unfamiliar with safe food options. It also allows a user to connect with other users in the area and to write reviews of a food location. The app contains resources on allergy research, travel advice, and safe foods as well. The biggest limitation of this solution is that it is only offered on IOS devices; people with Androids or other smartphones cannot use the app which excludes a huge number of potential clients from its benefits. A user must also leave the app to view a restaurant menu, which makes it more inconvenient for the user.

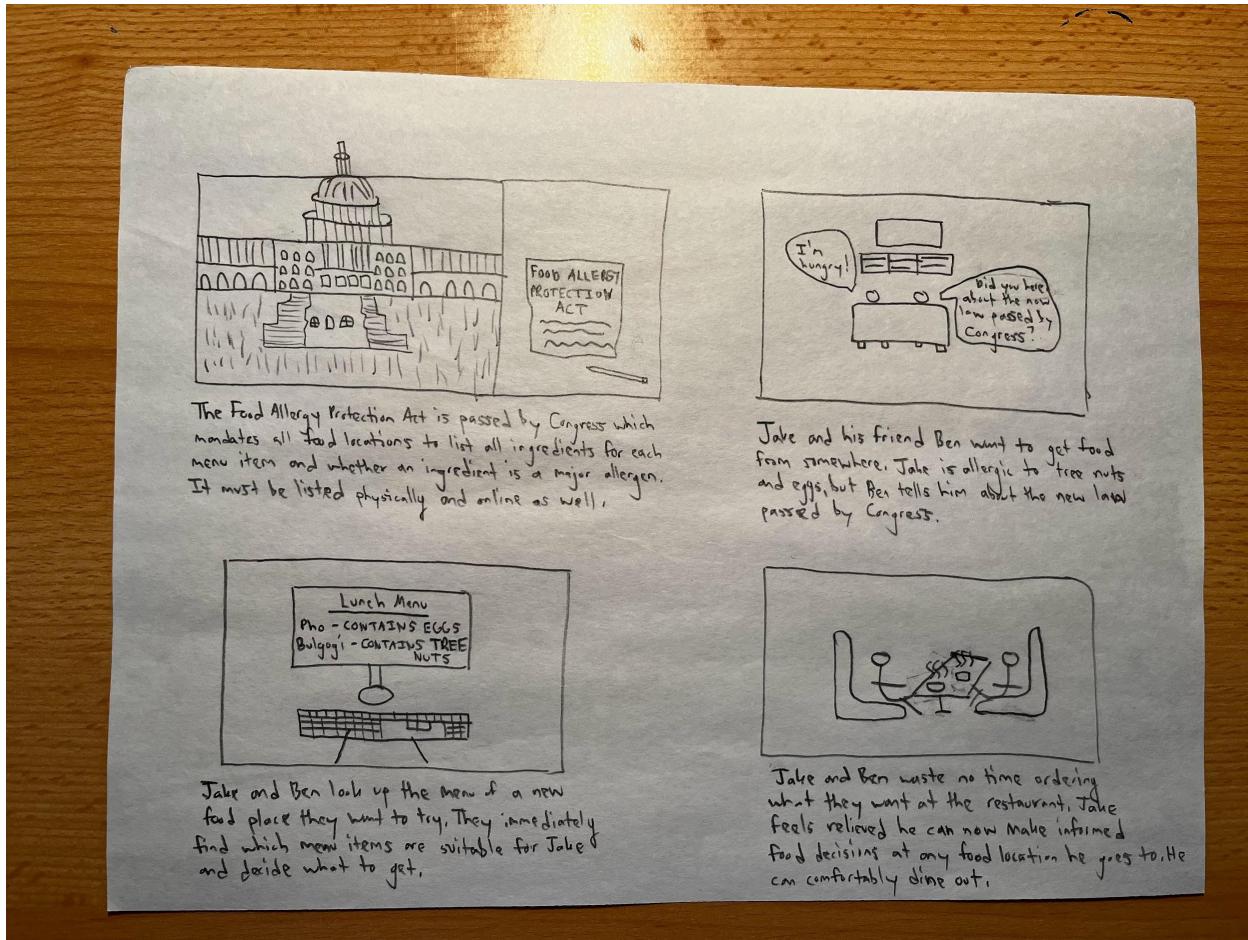
A fourth solution to this problem space is the Food Allergy Research and Education (FARE) organization. The organization's main website is <https://www.foodallergy.org>, and the organization is based in McLean, Virginia. FARE aims to improve the lives of people who deal with food allergies and dietary restrictions through education and advocacy initiatives that raise awareness around healthcare options. They also conduct research and invest millions of dollars into it. For example, FARE claims on its website that it has invested over \$100 million into food allergy research. It also claims to advocate for over 85 million Americans living with life-threatening food intolerances and has committed over \$85 million towards its fundraising goal of \$200 million for the FARE five-year "Contains: Courage Campaign". FARE stresses the need to raise awareness for food allergies being a "top tier disease" and has a large variety of educational and awareness campaigns listed on their website, such as the FARE Food Allergy College program, designed to improve the safety of college students with food allergies, and the Teal Pumpkin Project, which is the idea of adults leaving a teal pumpkin basket on Halloween at their doorstep that contains non-food treats for kids with allergies. In addition to the wide range of services that FARE offers, it also lists a plethora of food allergy resources on its website. Despite the impressive and all-around services and resources offered by FARE, their critical

limitation is the lack of direct impact on college students specifically. Although FARE has a college program that works with colleges to provide training to their dining staff, college students are still left on their own to navigate food options off campus; FARE also does not provide this program to every college in the country, so there are still some colleges that do not benefit from this program. The organization brings immense advocacy, research, and educational resources to the problem space, but the responsibility of actually implementing their ideas falls on the college and/or individual food locations. People with food allergies still must navigate suitable food locations.

A fifth solution to this problem space is the laws and policies passed by the federal government that require food locations to abide by them. There are a number of federal policies that have been passed over the years to offer comprehensive protection to those with food allergies and dietary restrictions. In 2004, the Food Allergen Labeling and Consumer Protection Act (FALCPA) identified milk, eggs, fish, shellfish, tree nuts, peanuts, wheat, and soybeans as major food allergens. These ingredients caused over 90% of the documented allergic reactions in the United States up to that point and the FALCPA requires packaged foods containing these ingredients to state on the label that it contains a “major food allergen” and to label the allergen source. The Food Allergy Safety, Treatment, Education, and Research (FASTER) Act was signed into law in 2021; it added sesame to the list of major food allergens identified by previous legislation, and it also requires the Secretary of Health and Human Services to submit a report on recommendations and strategies to enhance safety regarding food allergies. The report should contain information relating to the collection of data on the prevalence of food allergies, the development of food allergy diagnostics, the prevention of the onset of food allergies, the reduction of risks relating to living with food allergies, and the development of therapeutics to

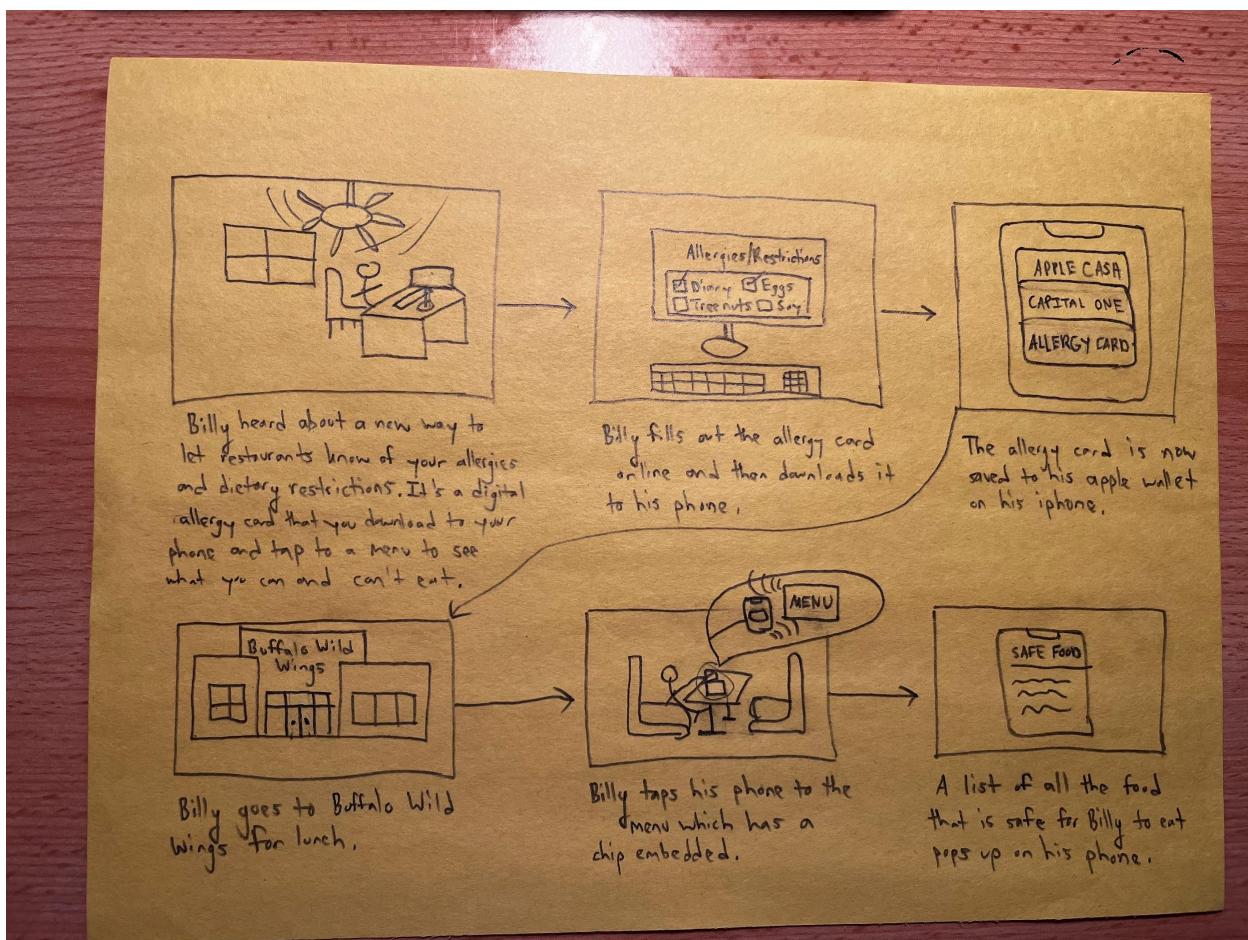
care for those with food allergies. The main limitation of these federal laws and policies is they don't target food locations/restaurants. The policies require food manufacturers to disclose on their packaged food labels whether there are any major allergens, but the laws don't apply to restaurants. Restaurants are not legally mandated to provide food allergy warnings which is a huge hindrance to those with dietary restrictions trying to find suitable food. It forces them to always be cautious and alert when dining out, which leads to an uncomfortable, dangerous, and time-consuming dining experience.

Design Ideas



My first design idea is a new federal law that is passed by Congress. The law is named the Food Allergy Protection Act and mandates that all food locations, regardless if it's a fine dining restaurant or food truck, must have a list of all their ingredients for each menu item and must also specify whether an ingredient is a major allergen (milk, eggs, tree nuts, fish, wheat, soy, peanuts, shellfish, and sesame). Each food location must specify its ingredients both physically (on menus at their location) and online as well (on their website). This design allows people with food allergies and dietary restrictions to immediately learn what type of suitable food a food location has without having to call or ask an employee there; it allows them to make efficient and safe dining decisions. This design responds to our persona's goal of being able to

enjoy social gatherings without worrying about allergens. Whenever our persona, Emily, goes out to eat with friends, they can make safe and informed decisions. My source of inspiration is the current federal laws in place that I mentioned in the investigating the solution space section. They protect consumers from major allergens in packaged food but not from food served at food locations.

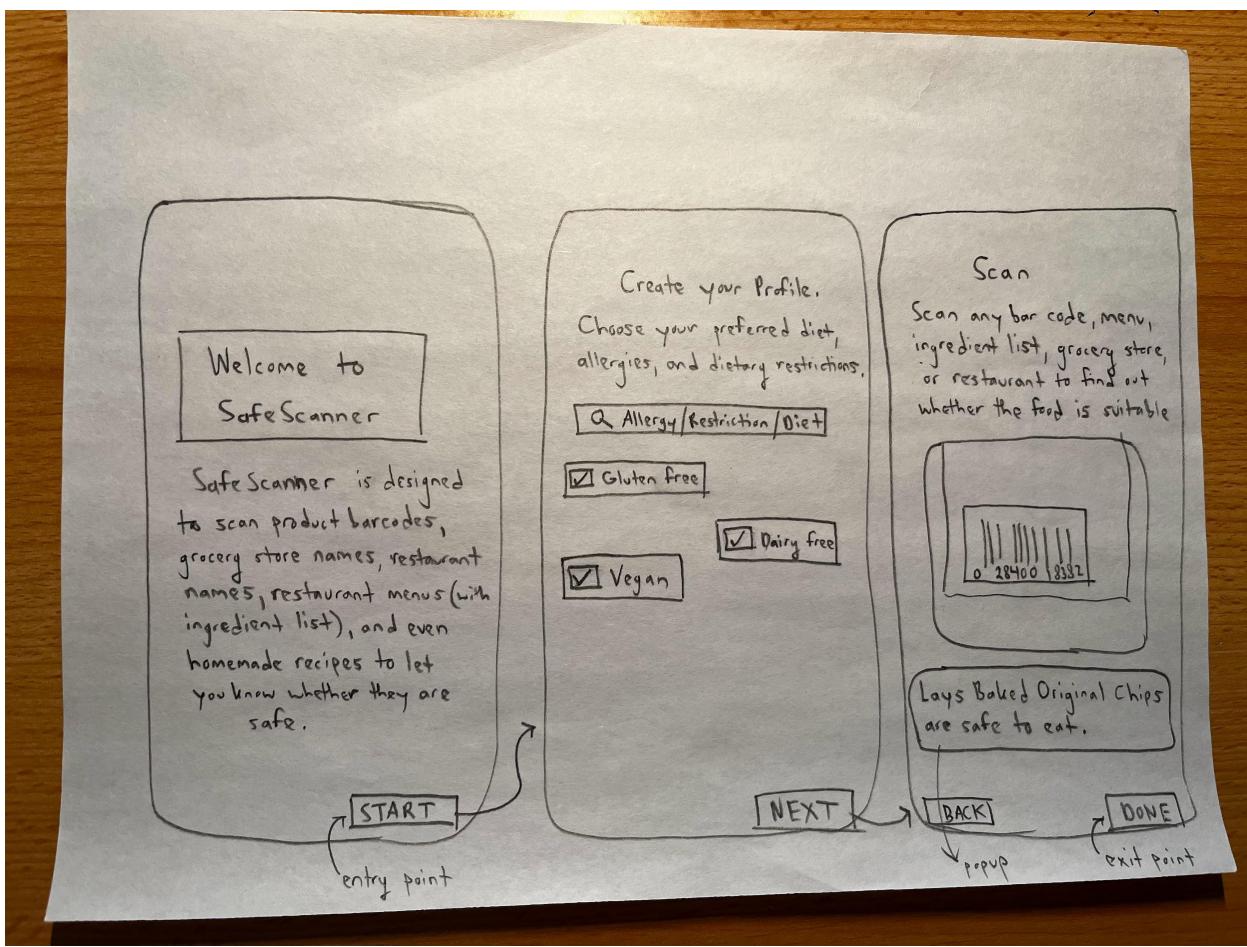


My second design idea is a digital allergy card that works via Near Field Communication (NFC). A user first fills out their allergy card online with their respective food allergies and dietary restrictions. They then download the digital allergy card to their phone and save it in their wallet, similar to how people download mobile tickets and save credit card info in their phone wallets. A user can now use this digital allergy card at any food location by simply tapping their phone on a menu, which has a chip embedded into it. After tapping their phone, a list of menu items that are safe to eat will appear on the user's phone screen. This design idea responds to our persona's goal of being able to enjoy social gatherings without worrying about allergies and managing their respective allergy efficiently. It provides both an efficient and safe method of

learning what kind of suitable food a person with dietary restrictions can eat at any food location.

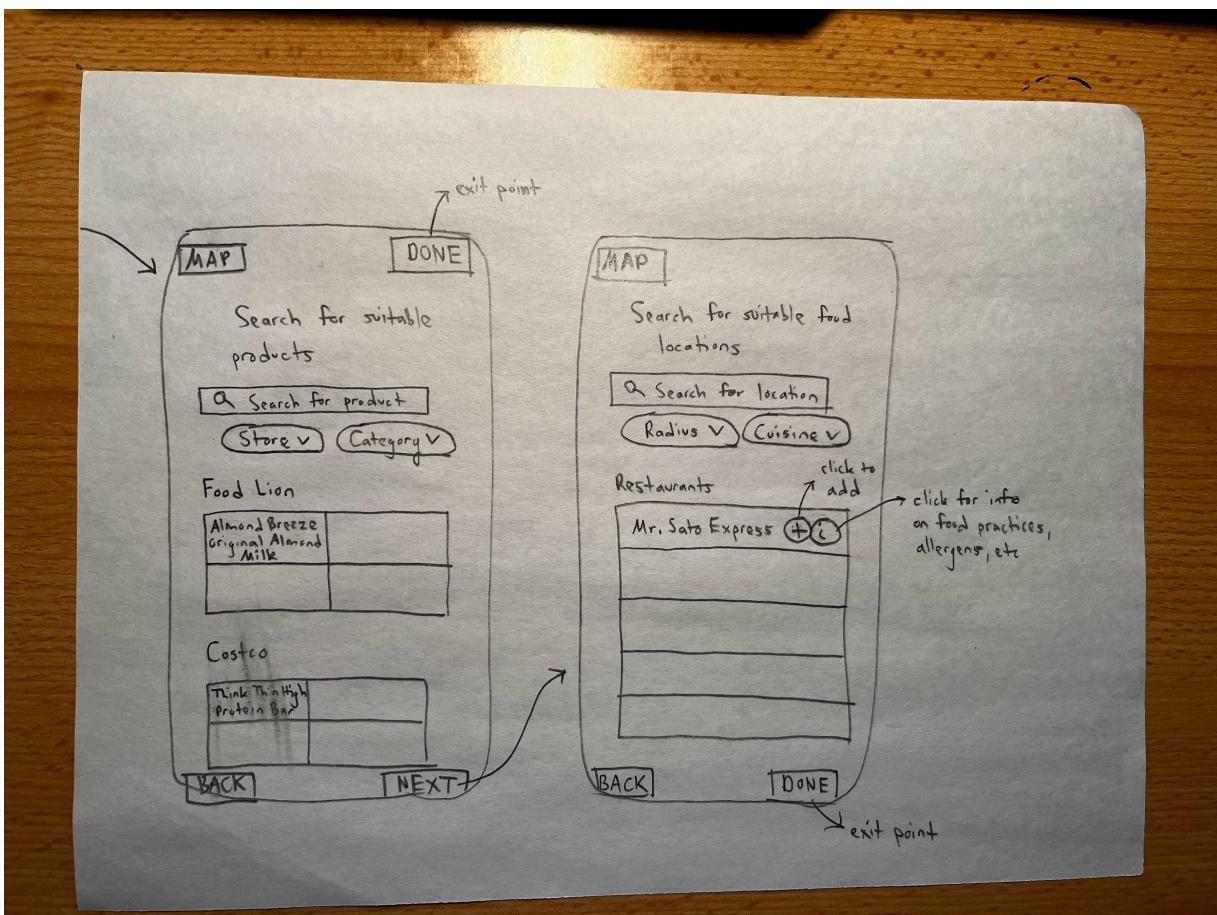
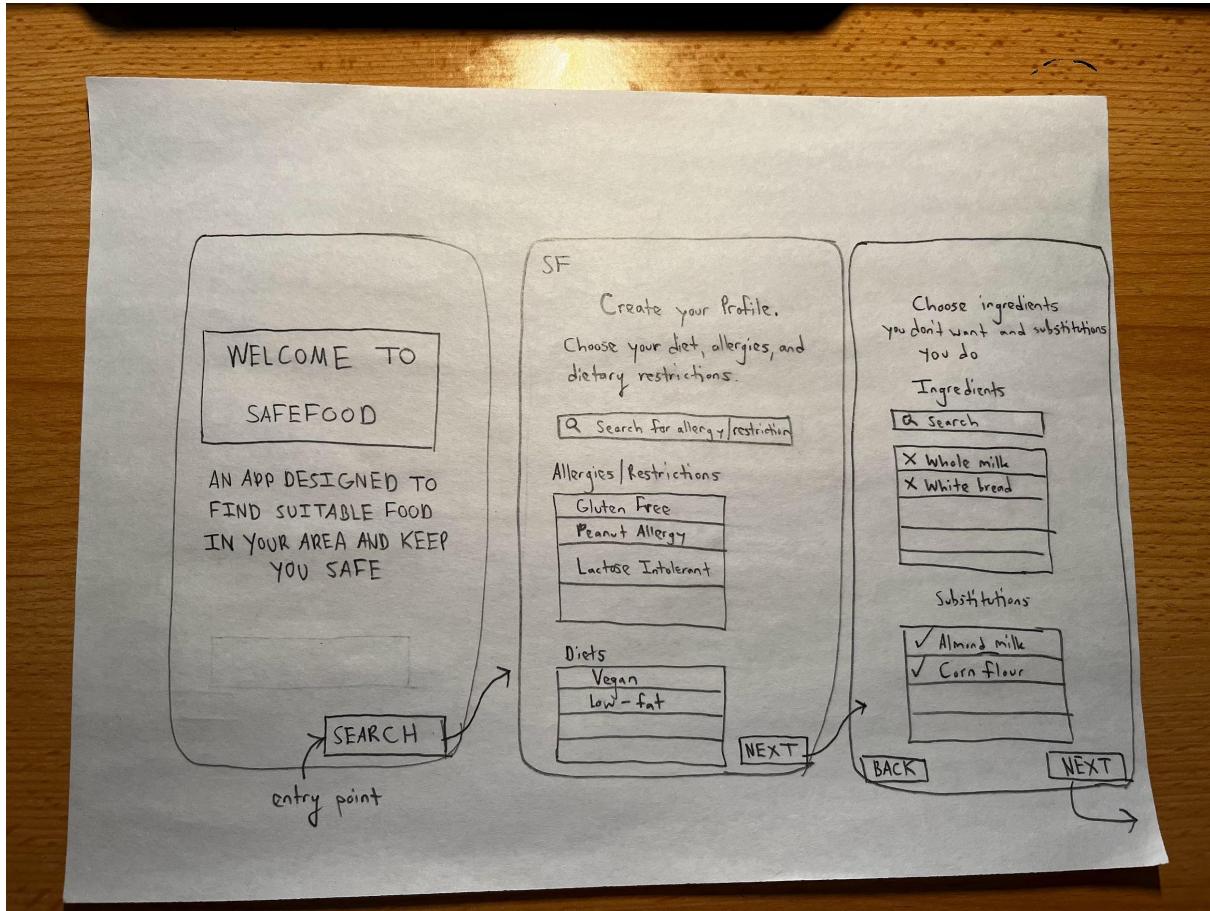
My source of inspiration for this idea comes from the physical allergy cards that already exist.

There are allergy cards one can fill out and carry around with them, but having a digital one on your phone and being able to filter out non-suitable food with a simple tap is much more efficient.

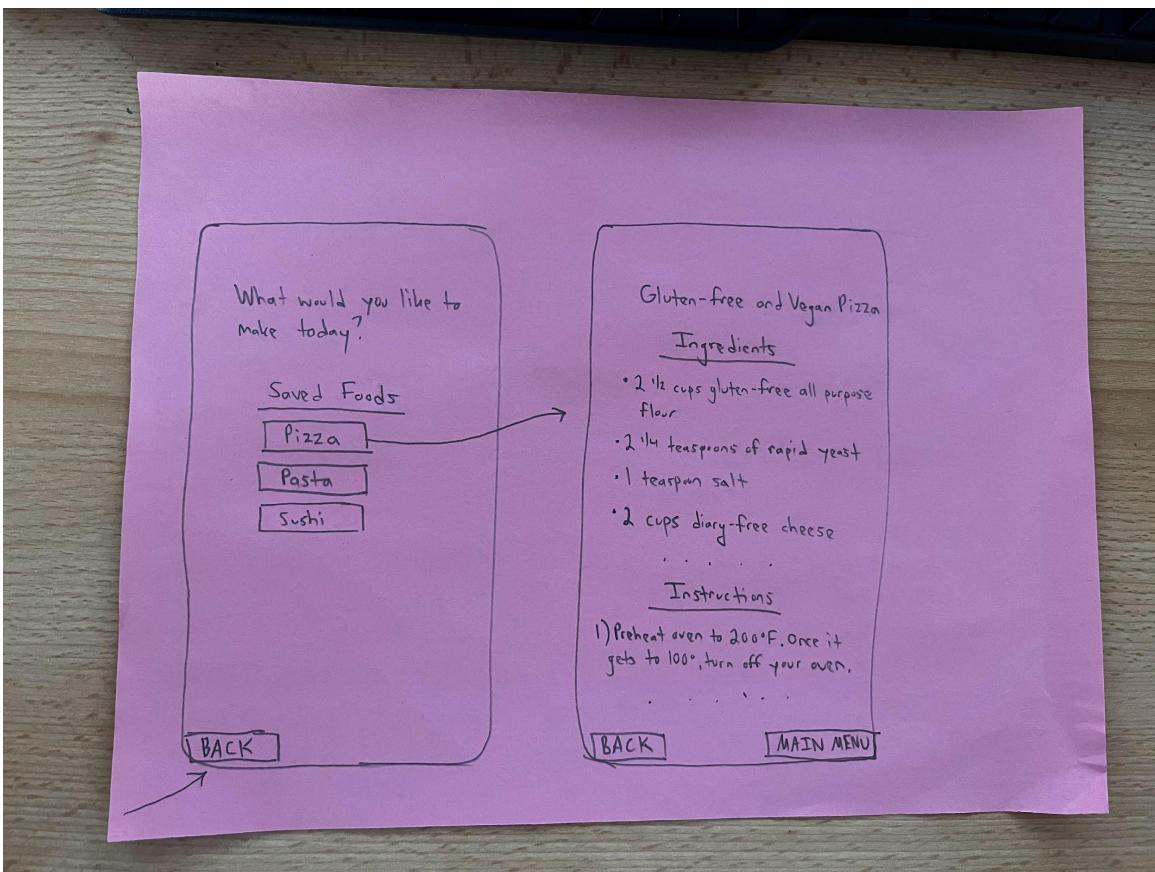
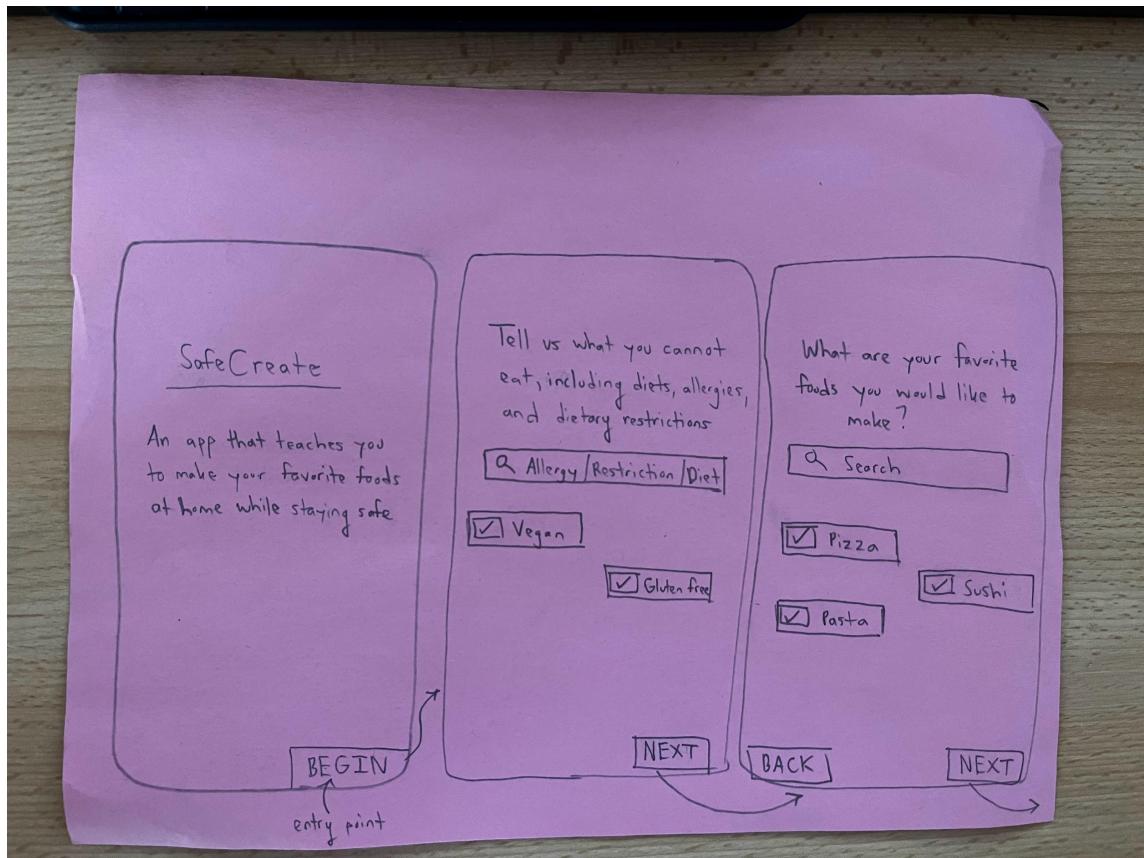


My third design idea is a mobile app that is able to scan product barcodes, grocery store names, restaurant names, restaurant menus, and homemade recipes to let the user know whether the food is suitable to eat. The user must first create their profile where they choose their preferred diet, allergies, and dietary restrictions. They are then able to scan a menu, ingredient list, restaurant name, or grocery store name. If they scan a restaurant or grocery store name, the app responds with a list of suitable food items that they sell. If it is a recipe or ingredient list, the app responds with whether all the ingredients are safe to eat. If it's a restaurant menu, the app responds with suitable menu items. This design idea responds to our persona's goal of enjoying social gatherings without having to worry about allergies and managing their allergy in an efficient manner. My source of inspiration comes from a feature of another app that allows its

users to scan packaged product's barcodes to find out whether any of the ingredients aren't safe. This app allows a user to scan not just packaged food but recipes, fresh ingredients, and cooked food as well to revolutionize how they eat out.



My fourth design idea is another mobile app named SAFEFOOD. It's designed to allow users to find a specific grocery store product that is suitable for them based on their dietary restrictions and to find suitable food locations based on their restrictions, radius, and cuisine that offer the most suitable food items. A user first creates their profile by choosing their preferred diet, their allergies, and their dietary restrictions. They are then prompted to choose which specific ingredients they cannot and do not want to consume and what substitutions/alternatives they would like instead. After creating their profile, a user is able to search for a grocery store product based on their profile info, the stores they select, and the category of food; there is a map feature that allows a user to find the closest suitable store. A user can also search for suitable food locations based on their profile info, radius, and type of cuisine they want. Each food location has an info button that a user can press to find out more about its food practices, allergens, etc; there is also a map feature for finding suitable food locations. This design idea responds to our persona's goals of managing their allergies efficiently and being able to enjoy social gatherings. My source of inspiration comes from the students we interviewed who conveyed to us that they want many of these features condensed into one app.



My fifth design idea is a mobile app named SafeCreate. It's designed to teach users with dietary restrictions how to make their favorite foods at home using suitable ingredients. A user must first input into the app what they are allergic to, their dietary restrictions, and any preferred diets they may have. It will then prompt the user to input some of their favorite foods. Once the user sets up their profile, they are able to select what kind of food they would like to make, and the app will generate a full recipe using alternative and substitute ingredients in place of the ingredients a user cannot eat. This design idea responds to our persona's goals of having a safe and enjoyable college experience and educating their peers on food allergies/dietary restrictions. Our persona, Emily, can safely make delicious food at home, so she doesn't have to worry about getting an allergic reaction. She can also educate her friends with this app on how amazing food can taste without some common ingredients they might be accustomed to cooking with. My source of inspiration for this idea is one of the students we interviewed. They mentioned how they feel comfortable and enjoy cooking at home because they get to control what ingredients they put in their food. I like to cook at home as well, but I often struggle to come up with a variety of meals. This app solves both of those problems by allowing anyone, especially those with dietary restrictions and food allergies, to make their favorite foods with custom ingredients at home.