Introduction

We are a group of 4 students tasked with designing an interface for an emerging startup. First we sketched 4 different designs for the interface and then combined these 4 designs into a final interactive high-fidelity prototype. The prototype was designed and revised iteratively through eye-tracking testing and critiques.

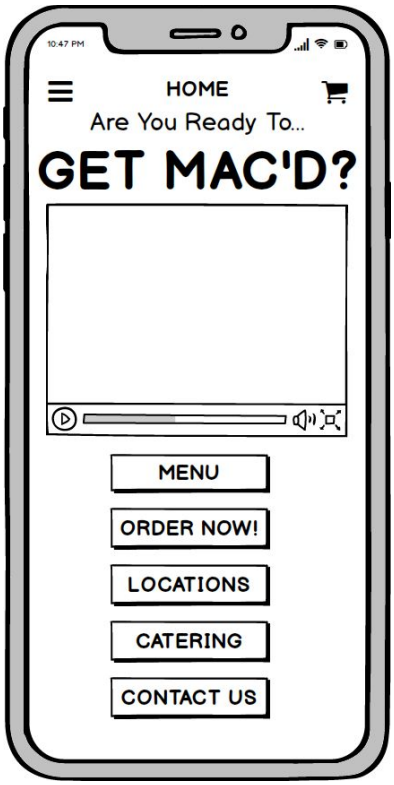
Selecting the startup

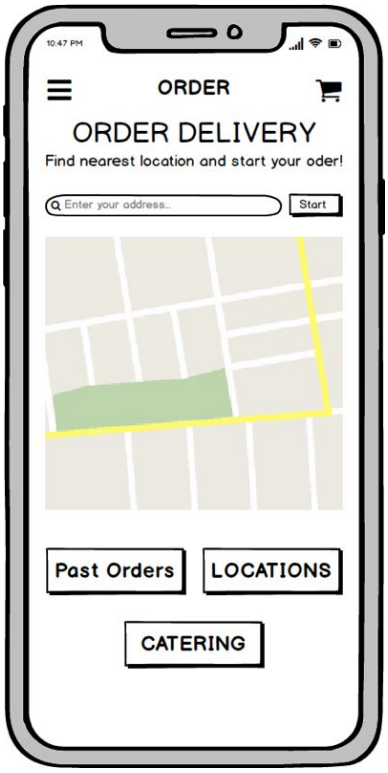
For our startup we chose MAC'D. The purpose of MAC'D is to allow mac and cheese lovers to build their own dish, with the goal of empowering people to exercise their creative side in a fast-casual way. We chose to create a mobile app because MAC'D currently does not have a mobile app. In addition, they believe in making it easy for people to order their creations and this could be better accomplished with the convenience and efficiency a mobile app offers.

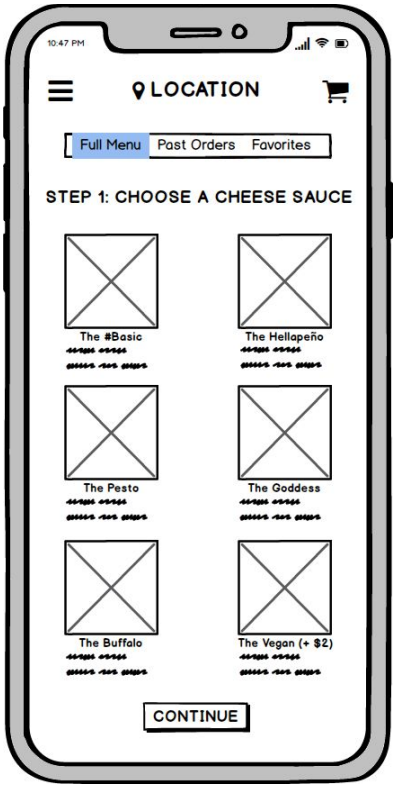
Sketches

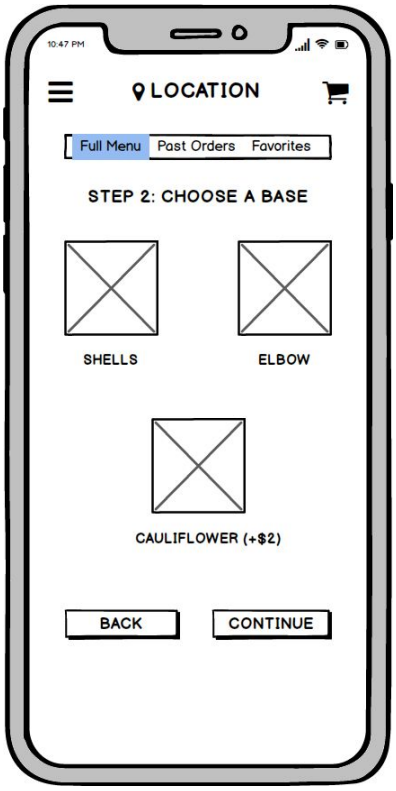
Then, as a group, we made make 4 sets of sketches. The sets contain all the screens needed to perform the main function of the app, which is to order MAC'D. Also, each set of sketches addresses our startup's goal in unique and different ways.

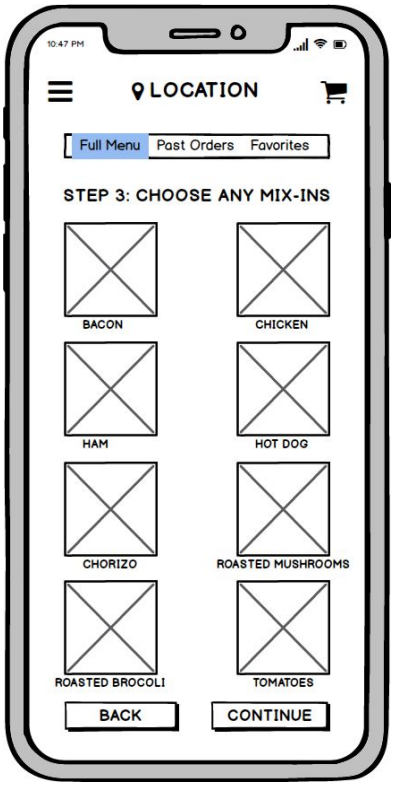
Set 1:

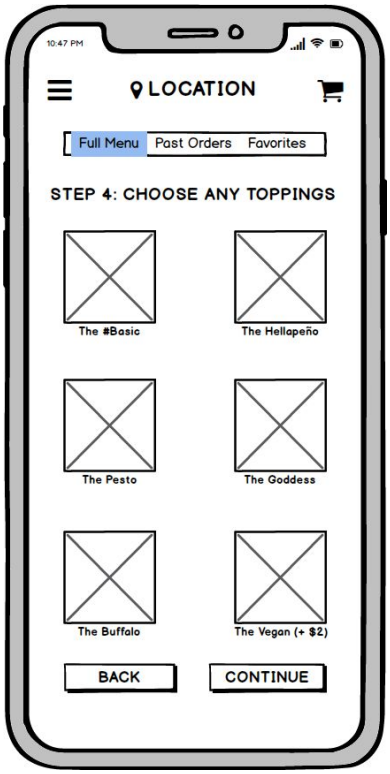


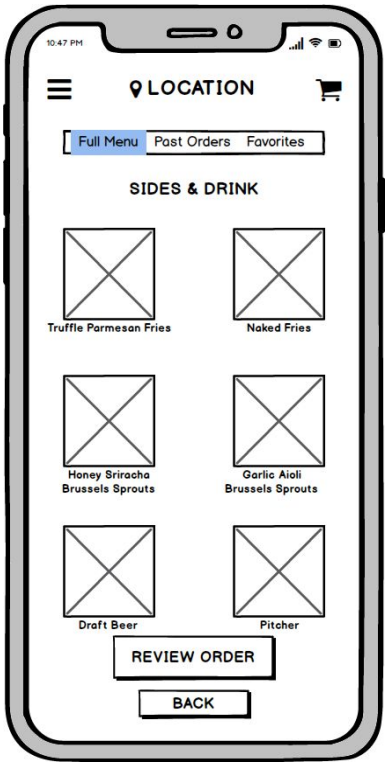


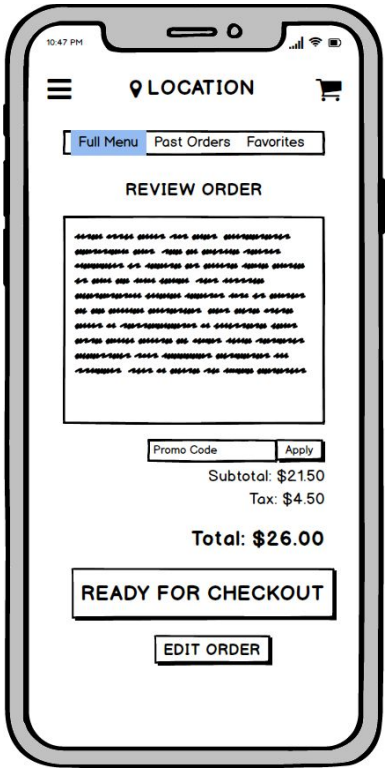



10:47 PM
LOCATION
Full Menu
Past Orders
Favorites
STEP 2: CHOOSE A BASE
SHELLS
ELBOW
CAULIFLOWER (+$2)
BACK
CONTINUE

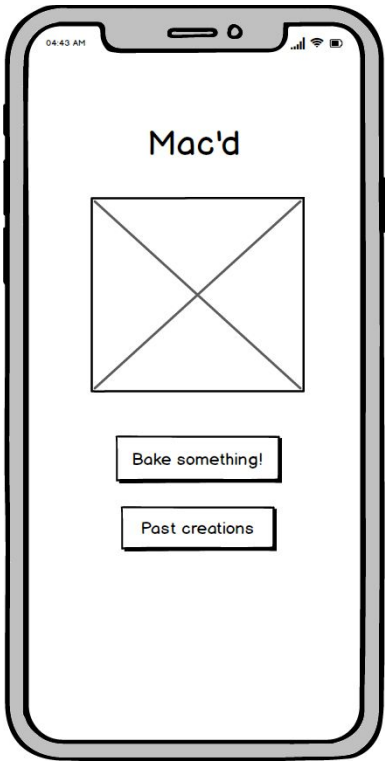

10:47 PM
LOCATION
Full Menu
Past Orders
Favorites
STEP 3: CHOOSE ANY MIX-INS
BACON
CHICKEN
HAM
HOT DOG
CHORIZO
ROASTED MUSHROOMS
ROASTED BROCOLI
TOMATOES
BACK
CONTINUE

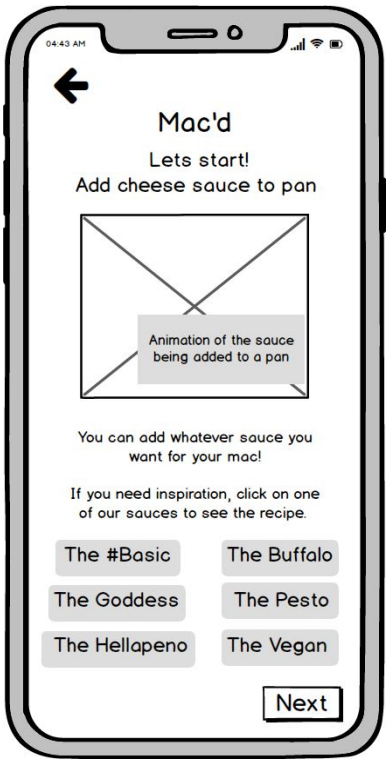

10:47 PM
LOCATION
Full Menu
Past Orders
Favorites
STEP 4: CHOOSE ANY TOPPINGS
The #Basic
The Hellapeño
The Pesto
The Goddess
The Buffalo
The Vegan (+ $2)
BACK
CONTINUE

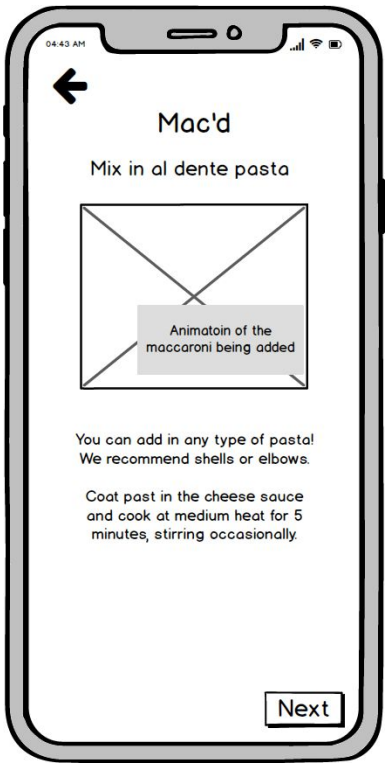

10:47 PM
LOCATION
Full Menu
Past Orders
Favorites
SIDES & DRINK
Truffle Parmesan Fries
Naked Fries
Honey Sriracha Brussels Sprouts
Garlic Aioli Brussels Sprouts
Draft Beer
Pitcher
REVIEW ORDER
BACK

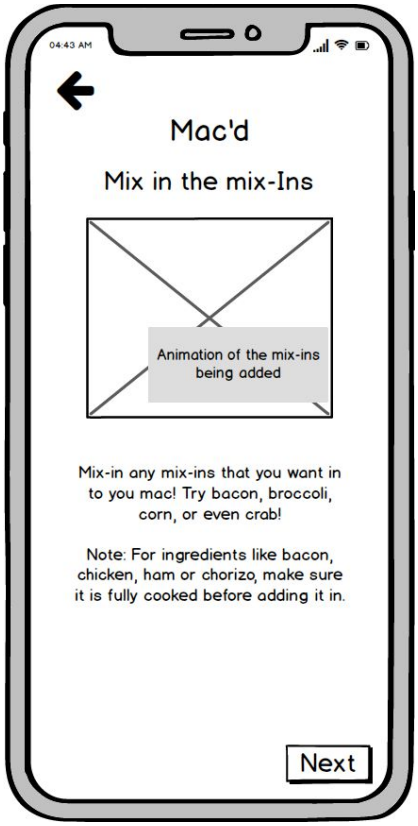

10:47 PM
LOCATION
Full Menu
Past Orders
Favorites
REVIEW ORDER
Promo Code
Apply
Subtotal: $21.50
Tax: $4.50
Total: $26.00
READY FOR CHECKOUT
EDIT ORDER

Set 2:

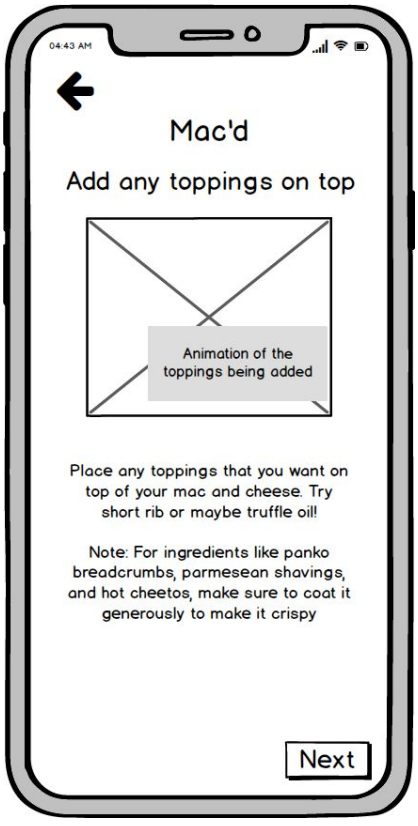

04:43 AM
Mac'd
Bake something!
Past creations

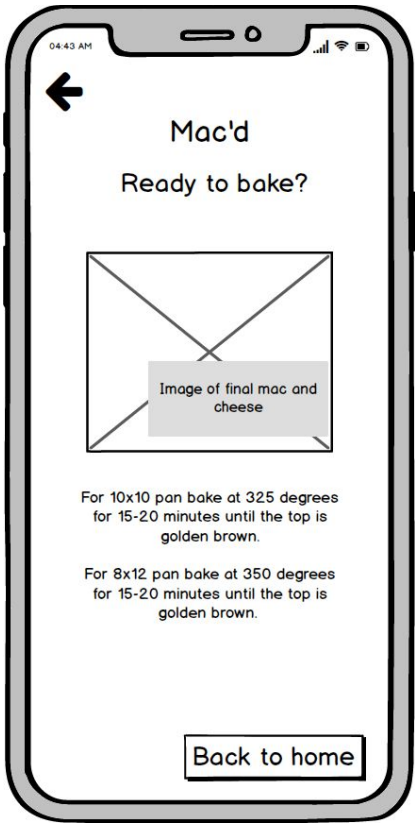

04:43 AM
Mac'd
Lets start!
Add cheese sauce to pan
Animation of the sauce being added to a pan
You can add whatever sauce you want for your mac!
If you need inspiration, click on one of our sauces to see the recipe.
The #Basic
The Buffalo
The Goddess
The Pesto
The Hellapeno
The Vegan
Next


04:43 AM
Mac'd
Mix in al dente pasta
Animatoin of the maccaroni being added
You can add in any type of pasta! We recommend shells or elbows.
Coat past in the cheese sauce and cook at medium heat for 5 minutes, stirring occasionally.
Next


04:43 AM
Mac'd
Mix in the mix-Ins
Animation of the mix-ins being added
Mix-in any mix-ins that you want in to you mac! Try bacon, broccoli, corn, or even crab!
Note: For ingredients like bacon, chicken, ham or chorizo, make sure it is fully cooked before adding it in.
Next

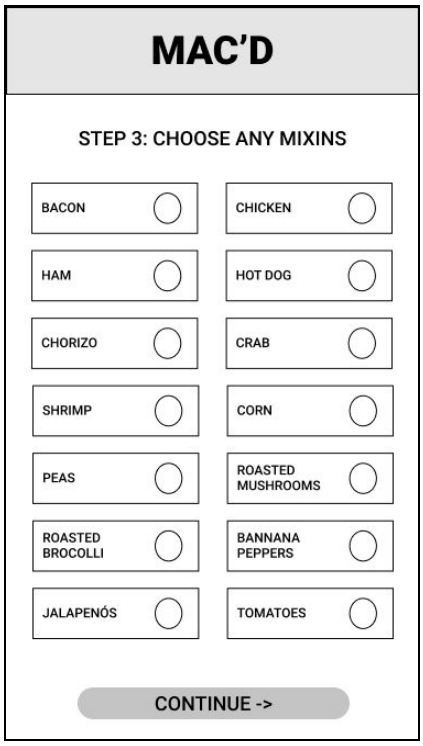

04:43 AM
Mac'd
Pour the mac into a pan
Animation of mac being poured into the pan
Spread your mac and cheese out evenly in the pan.
Note: if you want to add toppings save about a 1/2 inch of room from the rim of the pan.
Next


04:43 AM
Mac'd
Add any toppings on top
Animation of the toppings being added
Place any toppings that you want on top of your mac and cheese. Try short rib or maybe truffle oil!
Note: For ingredients like panko breadcrumbs, parmesean shavings, and hot cheetos, make sure to coat it generously to make it crispy
Next


04:43 AM
Mac'd
Ready to bake?
Image of final mac and cheese
For 10x10 pan bake at 325 degrees for 15-20 minutes until the top is golden brown.
For 8x12 pan bake at 350 degrees for 15-20 minutes until the top is golden brown.
Back to home

Set 3:


MAC'D
In Store Pickup
POSTMATES
Uber Eats
DOORDASH
CONTINUE ->
MAC'D
STEP 1: CHOOSE A CHEESE SAUCE
The #Basic
Because everyone has a little bit of #basic in them. Two types of cheddar, a secret spice mix, and a sprinkle of asiago, because basic can be a little extra, too!
The Hellapeño
As Bay Area natives, this one hella hits home. Our honey-jalapeño special is a little sweet, a little spice, and ... hella irresistible.
The Pesto
Our mean, green, savory machine mixes basil and olive oil with cheese. Yes, this can count toward your daily veggie intake.
The Goddess
There's nothing like the heavenly trio of cheddar, jack, and asiago with a garlicky kick. The perfect mac for the goddess in all of us.
The Buffalo
Creamy, dreamy, buffalo perfection. Tangy buffalo sauces meets cheddar in this orange monstrosity of a cheese sauce.
CONTINUE ->
MAC'D
STEP 2: CHOOSE A BASE
SHELLS
ELBOW
CAULIFLOWER
CONTINUE ->


MAC'D
STEP 3: CHOOSE ANY MIXINS
BACON
CHICKEN
HAM
HOT DOG
CHORIZO
CRAB
SHRIMP
CORN
PEAS
ROASTED MUSHROOMS
ROASTED BROCOLLI
BANNANA PEPPERS
JALAPENÓS
TOMATOES
CONTINUE ->
MAC'D
STEP 5: CHOOSE YOUR SIDES
TRUFFLED PARMESEAN FRIES
HONEY SRIRACHA BRUSSEL SPROUTS
GARLIC AIOLI BRUSSEL SORIUTS
NAKED FRIES
CONTINUE ->
MAC'D
STEP 4: CHOOSE ANY TOPPINGS
PULLED PORK
PARMESEAN SHAVINGS
PANKO BREADCUMBS
KOREAN SHORT RIB
TRUFFLE OIL
HOT CHEETOS
CONTINUE ->
Set 4:
Find your Mac'd Location:
Search
Allow Mac'd to access your location while you are using the app?
Your current location will be displayed on the map and used for directions, nearby search results, and estimated travel times.
Don't Allow
Allow
{Description of selected Mac'd location}
(detected location should be autoselected)
Mac'd
sign up with Google
sign up with Facebook
sign up with Twitter
login
sign up with email
continue as guest >

< back

Menu

Item 1
description

Item 2
description

Item 3
description

Item 4
description

< back

Menu

Item 1
description

order

< back

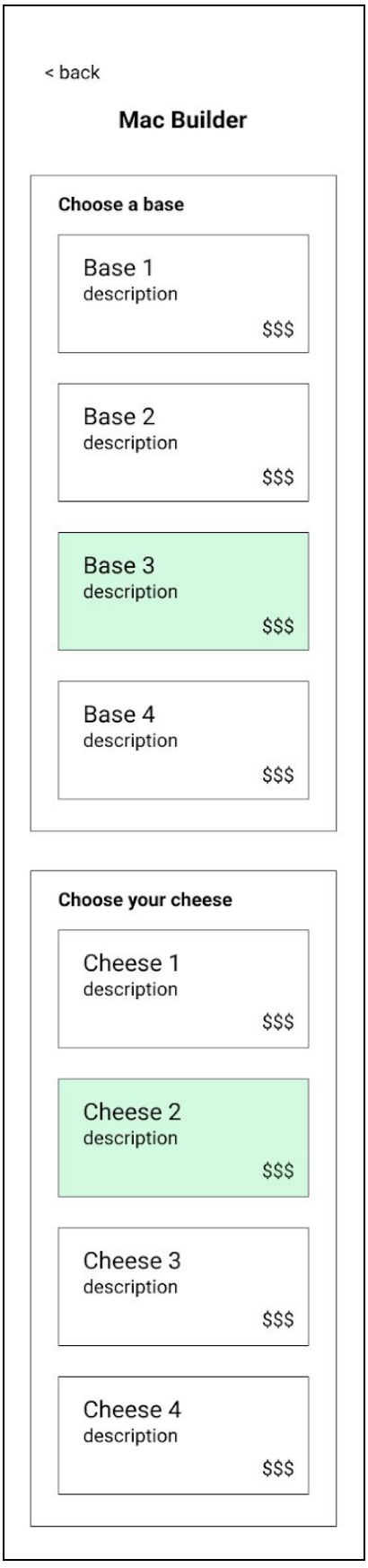
Plan your order

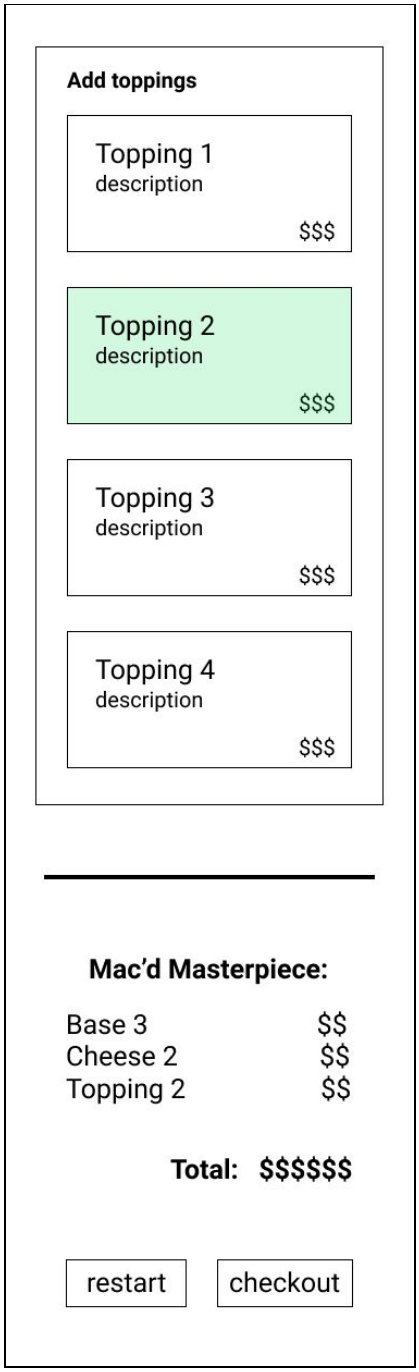
Menu
description of general menu options...

Build your own Mac
Choose a base, cheese, toppings, and more

Our mission

Note: we couldn't fit the Mac Builder screen on one page so we split it into these two images:





High-Fidelity Prototype

After creating the sketches, our next step was to design our final interactive high-fidelity prototype. We looked over each set and picked out things that worked and left out things that didn't. As a whole, we kept in mind our startup's goal when creating the final interface.

Our prototype can be found here: https://bit.ly/2QaF9fI

Overall, the background is white and most text black in order to increase readability. We felt that it was hard to read black text on top of MAC'Ds orange color Instead we used yellow, another color associated with MAC'D, for the header, and MAC'Ds orange for important text. Also, we used drop shadows to group similar content and created the affordance that buttons were clickable by giving them rounded edges and a dark background color. In addition, each page has a button for the previous page to allow users' to "undo" a navigation choice.

In our final prototype, we included a choose location screen that was included in set 1 and 4, because knowing the customer's location is important for both in-store pick-up and delivery. Also, we included from set 4 a feature that would allow users to create and sign into an account so their location preferences, payment information, and past orders would be stored in the app. This would increase convenience and efficiency by making it easier to place future orders. Additionally, we included from set 1 a screen that allows users to review their order and edit items before checking out, in order to prevent users from making mistakes like ordering the wrong number of items. We included from set 3 the option of choosing delivery through companies like UberEats and Doordash, rather than just in-store pick-up, because this is a crucial aspect of our startup's growth model. Sets 1-3 had separate pages for each part of building the MAC'D, while set 4 included all the steps in one page using a long vertical layout. Our final design took from set 4 because we wanted to prioritize the user's ability to modify their order *as they build it* and limit the number of screens the process required.

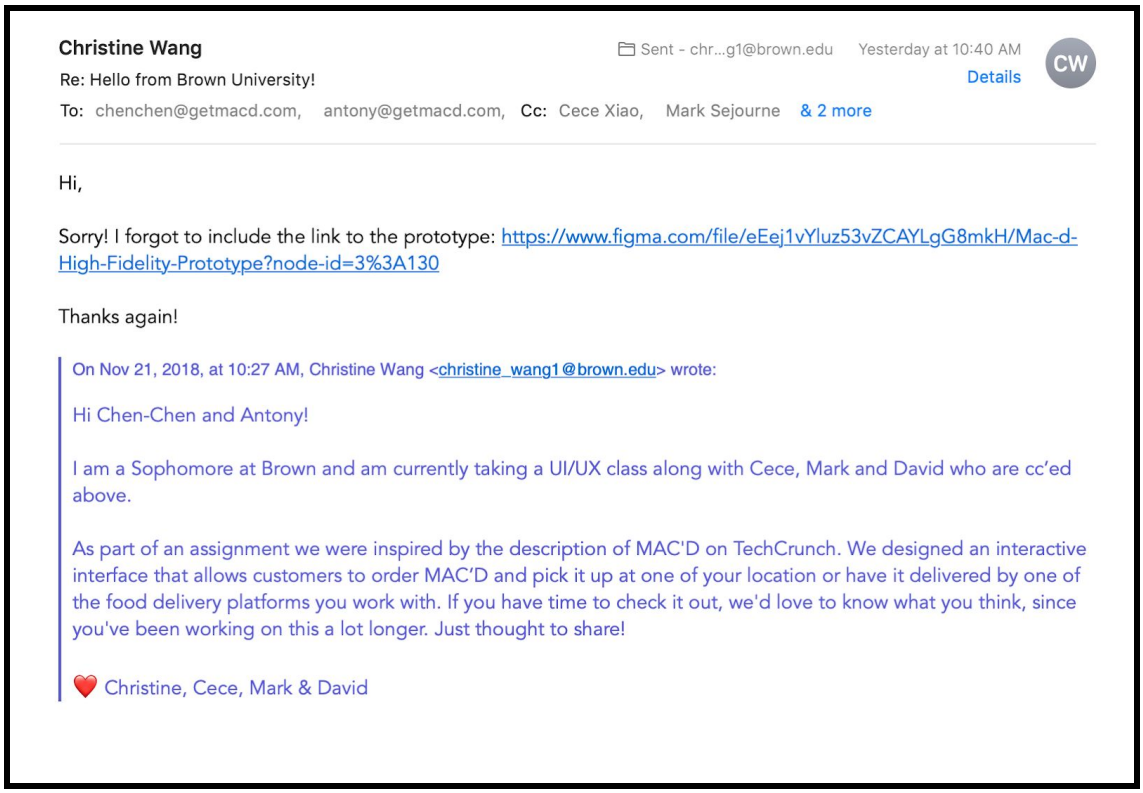
Getting Feedback

In order to improve our prototype, we had other students in our class critique our design and give us feedback. One person noted that some of the text on some screens was small and difficult to read. In response, we increase the text size and line height to maximize readability. Further, some noted that the application lacked the ability to pay in cash for in-store pick up, so we included an additional screen in order to offer that functionality. A TA noted that our "Add new credit card" option didn't look 'clickable,' so we we added a grey background to make it look like a button rather than floating text, and we added an arrow pointing to the right to communicate that it would navigate to a new page. Finally, someone said that we should add a delivery status page so that people who don't pick-up in store can monitor their order. Therefore, we added that screen which includes an ETA and a map of where the driver currently is.

Contacting MAC'D

We wanted to share our final prototype with MAC'D, so we emailed Chen Chen the current CEO and Antony the co-founder with a link to our design, asking for their thoughts.

Below is a screenshot of our email:



Christine Wang Sent - chr...g1@brown.edu Yesterday at 10:40 AM

Re: Hello from Brown University! Details

To: chenchen@getmacd.com, antony@getmacd.com, Cc: Cece Xiao, Mark Sejourne & 2 more

Hi,

Sorry! I forgot to include the link to the prototype: https://www.figma.com/file/eEej1vYluz53vZCAYLgG8mkH/Mac-d-High-Fidelity-Prototype?node-id=3%3A130

Thanks again!

> On Nov 21, 2018, at 10:27 AM, Christine Wang <christine_wang1@brown.edu> wrote:
>
> Hi Chen-Chen and Antony!
>
> I am a Sophomore at Brown and am currently taking a UI/UX class along with Cece, Mark and David who are cc'ed above.
>
> As part of an assignment we were inspired by the description of MAC'D on TechCrunch. We designed an interactive interface that allows customers to order MAC'D and pick it up at one of your location or have it delivered by one of the food delivery platforms you work with. If you have time to check it out, we'd love to know what you think, since you've been working on this a lot longer. Just thought to share!
>
> ❤️ Christine, Cece, Mark & David

Eye Tracking Analysis

Our final step in this assignment was to conduct an eye tracking test. This would help us understand how a user engages with our interface, what screens they spend time on, and what screens they end up navigating to.

Our Hypothesis

Before conducting the eye tracking, we hypothesized that the user will probably spend a majority of their time on the "Continue as Guest" button since this is the button they will probably click and it has the longest amount of text on the home screen. To order mac and cheese the user will most likely start on the login page and then navigate to choose a location. After that they will either choose to build your own mac or choose from a past order. Once they add items they will navigate to their cart, choose a delivery/pick up method, then what payment they want to use, and finally they will purchase their mac, ending on the order status screen. The navigation buttons are in black (a contrast to the white and yellow colors used for other UI elements) and at the bottom of the screens. Therefore, because of this consistency and the attention-grabbing color of the button, the user should not have an issue navigating to the different screens to complete their order.

Conducting the Test

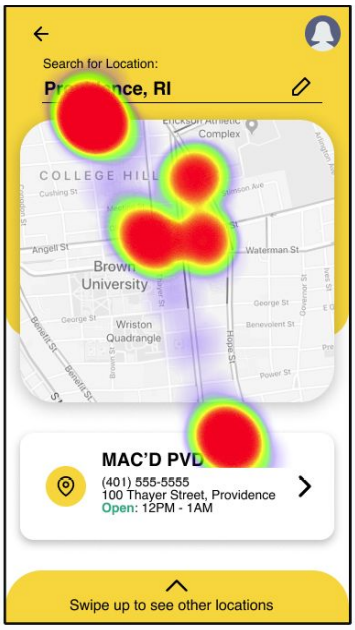
For our eye tracking test, We had a participant come in and use a computer set up with an eye tracker. We explained our startup, its purpose, and gave them the *task of ordering mac and cheese*. We let them navigate the app until they felt they had completed the task.

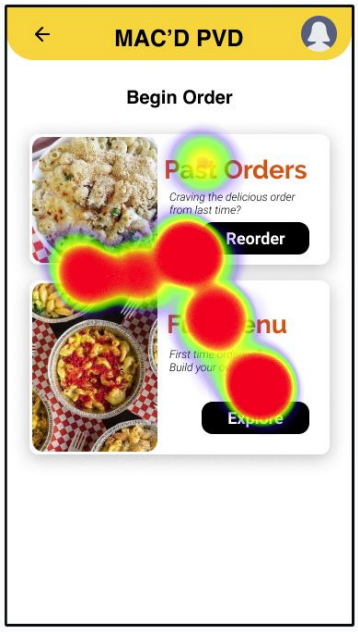
Analyzing Our Data

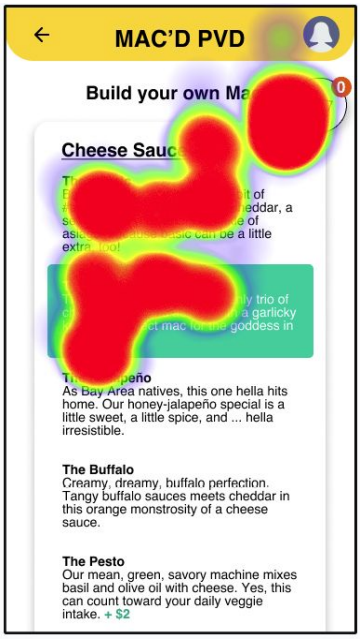
To analyze our data we created a heatmap.html which would take in the test data and create a data points array that would be used to create a heatmap for a given screen that the user looked at. We also created replay.html which would take in the test data and create dots where the user gazed.

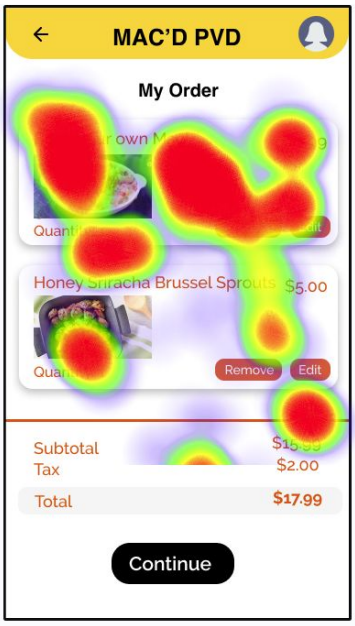
The folder containing the working visualization code can be found here:
https://drive.google.com/file/d/1NpzDafoo5d6-AX-hrnPmsnvA7yCQP1BC/view?usp=sharing

Shown below is a screenshot of a **heatmap** for each screen:

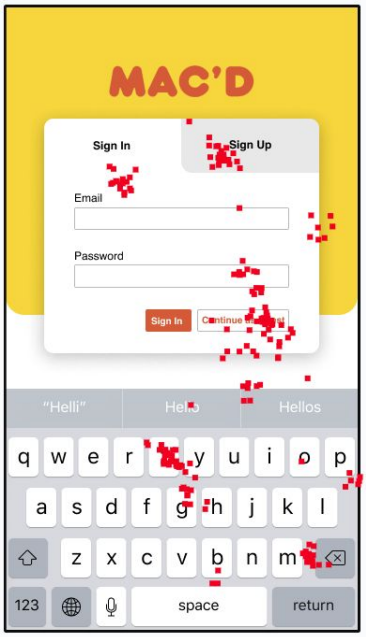


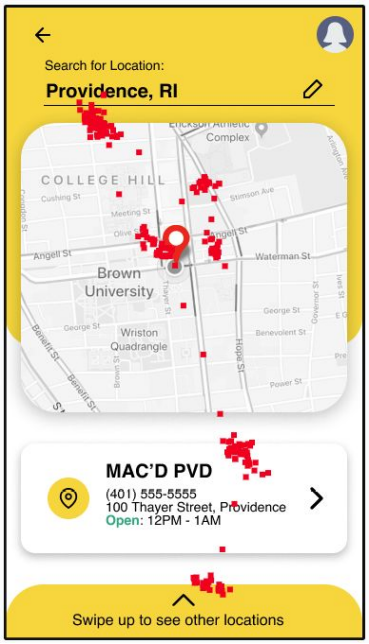


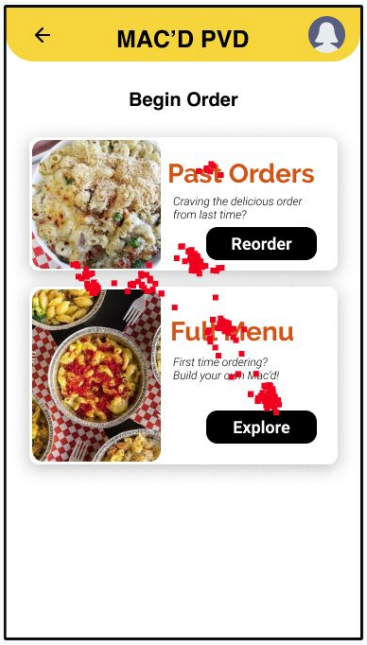


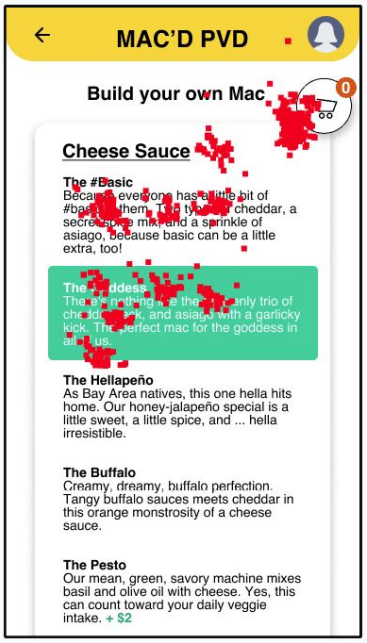


Shown below is a final shot of our **replay.html** (in folder linked above) for each screen:









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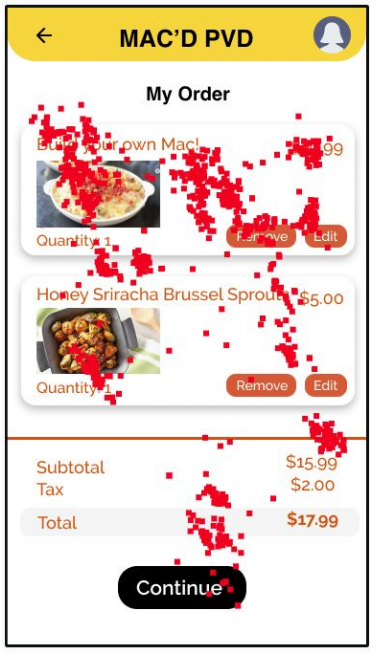

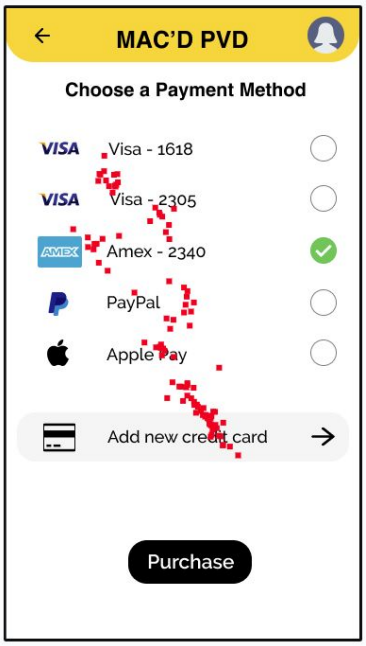

Comparing Results to Hypothesis

For the results above, the user followed the exact flow of screens we hypothesized in order to complete the given task. They started on the login, moved to the location screen and then added an item to their cart. From there they confirmed their order, chose a pickup/delivery option, and then a payment. We were correct in predicting that the user would spend a large amount of time on the “Continue as Guest” button as the heatmap for the login page has a large red spot for that button. However, they also looked at other areas like the “Sign In” and “Sign Out” buttons for a similar amount of time, so it’s not conclusive that they spent the most amount of time on the “Continue as Guest” button out of all the elements on the login screen.

Final Iteration

After the eye tracking, we made one final iteration based on what we learned. For the Build Your Own Mac screen the participant’s gaze never made it past the top half because their eye caught the cart icon and navigated straight to the cart screen. Therefore, we removed this icon and added a “View Cart” footer that would allow customer to navigate to the cart from any main menu page. In addition, the participant was confused about where the sides were, so we moved these to a separate screen and did the same for drinks and MAC’D favorites. Finally, the participant wanted to be able to choose the delivery address and when the delivery would be scheduled, so we added a Delivery Details screen.

Conclusion

With this assignment we explored different ways of solving our startup’s main purpose before creating a final prototype. Then we iterated on this prototype using feedback from our critique. Finally, we conducted an eye test to analyze how a user actually interacted with our prototype.