

**Name:** Justin Lassiter

**Course:** CSPB – 3112 Professional Development in Computer Science

**Title:** Full-Stack E-Commerce Website

**Introduction:** My project I worked on this semester was to create a full-stack e-commerce website. My overall goal with this project was familiarize myself with web development field of computer science. Being completely unfamiliar with this area of computer science prior to this semester, I really wanted to understand the underlying components that make a website work. By creating an e-commerce website and getting it all to function correctly, as well as look good, I could prove to myself that I had successfully learned the fundamentals. For my full-stack site, I focused on learning the basic components of front-end development: HTML, CSS and JavaScript. For this project, I didn't dive into front-end libraries such as React or Angular. This would have been too much in the time frame given of the course as my research before beginning showed that these libraries could be a large undertaking in and of themselves. For the back-end portion of my project, I focused on learning the node.js JavaScript runtime environment to run my server, the express.js package to initiate and manage my server and, lastly, I learned SQL and used a SQLite database to store order and other necessary data.

**Background:** There are a few reasons why I decided to do this project. The first is that I've always wanted to learn web development. Up until now, I really haven't had the chance to dive into this part of computer science with my other coursework, job, etc., but it's always been something that's been bothering me that I didn't know anything about. Up until this semester, I've learned languages like Python and C++ and the style of programming I've learned up until now has been synchronous programming, where instructions are performed sequentially, and I've never implemented any type of graphical user interface; so, the idea of using a programming language to create elements and have them appear on the screen, while mixing it with HTML and CSS, actually was a true mystery and seemed a little daunting before I began, but at the same time very exciting. The second reason I wanted to learn web development is because of the additional value I'd bring to any future position I have and knowing the technologies behind it will make me more marketable as I begin to look for internships and jobs. I see many job postings focused on web development or indicate that they would like the candidate to have some experience in these technologies, but even if I end up going into a different sector of computer science, the more I know, the better. The third reason for this e-commerce project specifically is that my wife has a small side business, with which she hand-makes and sells jewelry that contains personal items that her customers would like included in the jewelry molds. For example, she has made many bracelets for people that have funeral flowers from passed

away loved ones embedded in the molds. She brought up one day making an Etsy store and I thought, here's a good opportunity to learn how to make our own e-commerce site and envisioned it being a great project to do for this class. The overall e-commerce store I envisioned creating is conceptually simple: a home page, product pages for each type of product offered, pages handling the checkout process (cart, customer information, payment details) and an order dashboard where the site owner can view and interact with the submitted orders.

**Methodology, Materials and Methods:** As one of the obstacles I had listed as a risk to completion in my proposal is that when it comes to computer science, my focus has really been on the content provided to us in our course syllabus. I've never really ventured out 'on my own' in learning a new, different topic outside of performing research on specific topics I'm focused on or looking up programming language information. This had me a little nervous in the beginning because I am a person that likes structure. Coming from an accounting background, this is something that I really need to focus on getting out of, breaking that mold if you will. Accounting is relatively straight forward, as in the education is really learn the material in the book, learn how to do journal entries and specific transaction types, use, for the most part, specific sources for information (e.g. the IRS tax code). Even the CPA exam was learning the books covering the specific types of information and pass the exam. I'm not trying to downplay the difficulty of the accounting profession because it has many challenges, but this was a big motivation for me to make a career switch. From my limited experience so far in the computer science field, the need to be able to adapt is a critical skill to have – being able to learn from where you can and solve problems by doing research where you can find the information. It's daunting, but it's very exciting and it opens endless possibilities.

I was able to find a lot of tutorials online that covered what I was wanting to learn. I ultimately found several paths on [codecademy.com](https://www.codecademy.com) that provide well-structured course work on what I needed to learn for my project.

Here are the course's that I completed for this project on Codecademy and some of the high-level contents of each course:



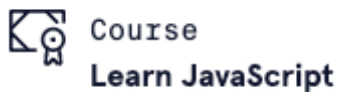
[Syllabus](#) | [Certificate](#)

- Elements and Structure (Overall Basic Syntax of HTML)
- Tables
- Forms



[Syllabus](#) | [Certificate](#)

- Basic Syntax and how to use selectors (there's so much here)
- Display and Positioning – Flex Box is Big – especially in Bootstrap



[Syllabus](#) | [Certificate](#)

- Functions, conditionals, scope, arrays, loops, objects – Really all the basics
- JavaScript specific parts of the language like High-Order functions and the related callback functions, classes, JS modules in both the browser and Node.js
- Async JavaScript – I learned about the event loop and how async functions are added to the event queue then to the call stack once it's free.
- The Fetch API and async-await functions



## Course

### Learn Intermediate JavaScript

[Syllabus](#) | [Certificate](#)

- This course did a deeper dive on promises and async-await type functions
- Modules and the process of importing and exporting them into JavaScript code
- Error handling
- Requests - specifically how to use the browser's built in Fetch API



## Skill Path

### Create a Back-End App with JavaScript

[Syllabus](#) | [Certificate](#)

- Node.js
  - o Built-in modules, import/export modules, event-driven architecture – This was just the basics of how to use Node.js – enough to get me up and running with it
- Express.js
  - o Routers, Routers, Middleware and the middleware stack, Route Parameters, how to parse data received from the body of the request, how to send responses
- SQL and SQLite
  - o The basics of SQL – how to perform commands for creating, updating and deleting data from a database. I also went through some more advanced topics like perform SQL calculations
- Setting up and managing a SQLite database
- SQLite3 node.js package that allows JavaScript to interact with the SQLite database

These were the main topics I needed to learn to create my website. The nice thing about these courses was that it didn't go into excruciating detail on each topic, but they give a high-level introduction along with interactive exercises. After I'd get through the course work, or as I was working on my project, I would then go to other resources like [geeksforgeeks.org](https://www.geeksforgeeks.org/) or [w3schools.com](https://www.w3schools.com/) when I wanted further detail on a topic. Additionally, I used Bootstrap to help with the styling of my website, which I initially learned on [freecodecamp.org](https://www.freecodecamp.org/); consequently, [getbootstrap.com](https://getbootstrap.com/) was a major resource as well. However, the biggest resource I used for this project outside of Codecademy was the

Mozilla Developer Network ([developer.mozilla.org](https://developer.mozilla.org)). This site contained, for the most part, all the documentation I needed when it came to the front-end portion of my site as well as for general JavaScript language information even when working in Node.js. Which leads me to the back-end, where I mainly used the documentation from [nodejs.org](https://nodejs.org) and [express.js](https://express.js). I spent a lot of time with the express documentation as this was the main package I was working with building out my server. Outside of these backend resources, I occasionally needed to use the documentation for various packages within my server. For example, SQLite3 and express-sessions were two major dependencies in my server, for which I had to review the documentation.

I tried to keep my use of AI limited – I sometimes used Claude to explain a concept or confirm whether my thought on how to solve a problem would be the correct approach or not and see if there is a better way. I always tried to think through the issue first and then, and only then, try to get its input and I typically would ask it not to provide code unless it was one of those ‘show me a better way’ scenarios. In the real world, I would use it a lot more, but I didn’t want it to take away the learning component from me.

Overall, for my process of building my project, the first month of the course was focused primarily on learning the content I needed. I started first with learning HTML, CSS and JavaScript. Once I had a good understanding of these languages, I was able to start building out the front-end of the site and then concurrently began learning the backend in the second month. For the backend, I started implementing things, at least trying things out, as I was learning. This led to things sometimes getting a little messy in my codebase, but I think this is natural when trying to learn something and implement at the same time. This was nothing a little cleanup couldn’t fix.

I tried to keep a steady pace from week to week and would spend a few hours a night during the week working on it and a solid portion of the weekends. Hindsight, I would probably try to take some more breaks for my family’s sake, but I really did enjoy working through it.

**Results:** I feel like I learned so much working on this project. I took the concept of web development that was, outside of being a user, completely foreign to me. As I noted, understanding how JavaScript, HTML and CSS all interacted and made things appear and disappear from the screen almost seemed like magic to me. Even the concept of how a server works and how it listens for and receives requests based on routes, this was just a foreign concept to me. Now that I’ve built out all these components myself into a functioning website, I’m still in a state of disbelief I got it all to work. As this was my end

goal, just looking at my functioning site gives me evidence that I've learned what I set out to do.

**My project assessments were as follows:**

- Getting through the Codecademy course work on web development, which I highlighted above. Obtaining the certifications gave me a little boost in knowing that I was progressing. However, the overwhelming evidence for myself was creating the functioning website.
- For the website itself, the evaluation criteria were:
  - o The website needs to look good and provide a good user interface. Everything within the site where a user should be able to interact with the website, should work correctly and agree with the specifications I lay out for the site before beginning.
  - o Data should be correctly posted to and pulled from the SQLite database.
  - o I initially want to just have 3 main sections / pages of the website: the home page, the product page and an order page. Once I can get these working, I want to then start adding in additional features like allowing the site owner to access and interact with the order details via dashboard, have different types of products, allow users and the site owner to log in to accounts, etc.

I was able to get all of this implemented, with the exception of the login portion. I've been working learning about the security considerations of a website, but I couldn't hit that goal prior to the end of the class just due to time. This is something I will continue to work on and implement after. I will counter this by noting there were some unexpected things I had to learn that I wasn't familiar with such as working with sessions. It took me some time to realize that sessions were what is used to let a site user's data persist while they are navigating from page to page. This is how I maintain their cart. It took a little extra time to get this implemented so lesson learned is to always prepare and budget for the unexpected.

**Note:** I've added some screenprints of my site at the bottom of the report for reference.

**Discussion / Reflection:** I was able to hit my overall goals of this project. My main objective was to learn the basics of web development and to prove that learning with the creation of an e-commerce website. I've created a website that allows the user to browse the different product offerings, customize, add products and retain them in a cart via a session, provide their personal information for checkout and submit an order to the server

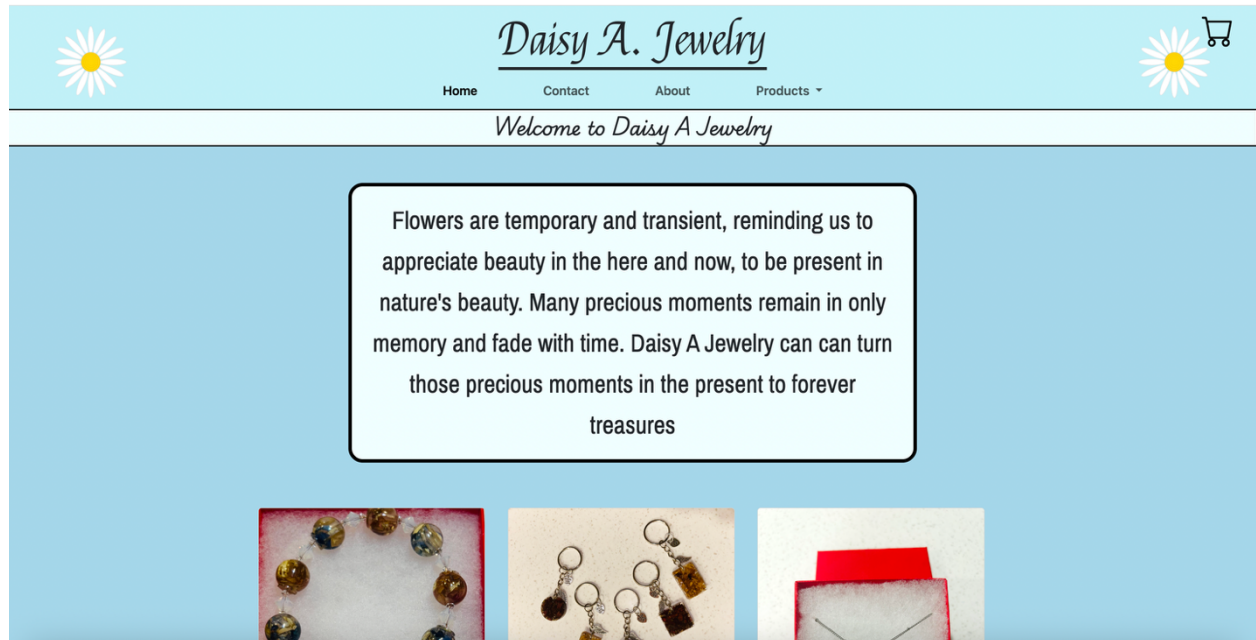
all while being maintained within a database. In my opinion, the website looks reasonably good for my current skill level, which allows the customer to have a good shopping experience. I feel very good about what I was able to accomplish with this project. I put a lot of work into learning all the necessary components, sometimes had some late nights because, frankly, I didn't want to stop working on it. Ultimately what allowed me to reach my goals on this project was staying dedicated to it and to keep pushing forward on it. It was a challenge sometimes to not get bogged down in details certain things, for example CSS, so learning how to keep moving on it was a slight challenge in the beginning. I feel though this alone has helped me grow more into developer. In my normal coursework, I tend to get sidetracked and want to keep digging on things, but in the real world, I'd imagine this is not what is desired, but more of research what's needed, fix it and move on to the next problem. This was really my first experience in a way doing this because I didn't have time to waste to get the site up and running with my full-time job and family also demanding significant time. It was an overall great learning experience.

**Conclusion:** By doing this project, I feel like I'm in a much better position to be an applicant for internships and be a better computer scientist overall. I'm by no means an expert in any of these areas, but I feel much more confident in talking about them in an interview. I can see myself even being a full-stack software engineer in the future. I thoroughly enjoyed working on this and, in all honesty, when I'm working my finance job, I wish I could be doing this instead. Something I'm still trying to figure out is what sector of computer science I want to go in. Whether or not I end up doing web development for a job, it brings me comfort that I've already found one sector of computer science that I would really enjoy.

Going forward, I'm going to keep working on this website and make the improvements I'm still needing to do such as the user logins, security components and better error handling (I really didn't spend as much time as I would have liked on how to respond to and present errors. Eventually, I would like to get this website online, so I would need to change from it using a SQLite to PostgreSQL database, implement payment abilities through a service, among other things. I'm excited that I'll be able to have this as an ongoing project. Outside of this, I have some other ideas of projects I could work on and put these new web development skills to work. I'm even trying to find some areas at work where I could put them to use. I think the next big component I'd like to learn is React as this is a big want on a lot of job applications. So perhaps a project using this framework. I'm very excited about the possibilities of projects that I can now do. But next up is to begin applying for internships for I'm ready to go into the real world and let the learning really take off.

## Project Example Order Walkthrough

### 1. Homepage




### 2. About Page







- Example of the product pages. All product pages are similar – This is using bracelets as an example transaction.



[Home](#) [Contact](#) [About](#) [Products](#)



Bracelets by Daisy A Jewelry



Description

Wear your memories with a bracelet the contains just that. Within our bracelet mold, we can embed flowers, cat fur, or really anything as long as it's small enough to fit the mold! As noted within our [About page](#), our first bracelets made were inspired from the passing of our beloved grandmother. Using the flowers from the funeral, we created a wearable memory for the entire family.

\$30.00 per Bracelet

Select Metal Type Antique Bronze

Select Wrist Size 6.5"

Select the number of bracelets to order 3

\*If total number ordered is greater than 12 bracelets, there will be a surcharge of \$3.00 per bracelet

Total Price Before Tax and Shipping: \$90.00


Please provide details on what you would like placed within the bracelet mold (cat fur, flowers, etc.) and any other details regarding your order. If you have questions prior to placing an order, please contact me [here](#). Instructions for sending in personal items will be provided at checkout.

I would like to add flowers to the bracelets


[Add to Cart](#) [View Cart](#)

Daisy A. Jewelry - A Chelsea Cassiter Production

- Customer cart – We can see the above bracelet has been added to cart. This item will remain a part of the user's cart until it is removed or the transaction is complete - maintained via a session. The user is free to navigate the site and previously added items will persist.



[Home](#) [Contact](#) [About](#) [Products](#)




Cart


Item #	Product Type	Metal Type	Size	Quantity	Price /Unit	Extended Price	Order Notes	Remove from Cart
1	Bracelet	Antique Bronze	6.5	3	\$30.00	\$90.00	I would like to add flowers to the bracelets	X
					Total Before Tax and Shipping	\$90.00		

[Continue to Checkout](#)

5. Customer Checkout – Here the user provides required details. Additionally, once the zip is provided, an API call to API ninjas is made to calculate and return the required sales tax. I've skipped the payment portion of it for now as this would require working with a service. I will need to add this in later. I also have some basic input validations in place, but this is something I will also expand on.



[Home](#) [Contact](#) [About](#) [Products](#)



Home > Cart > Checkout

Complete your Order!

Personal and Contact Information


Shipping Information

Summary	
Total Price Before Tax and Shipping	\$90.00
Sales Tax	\$6.65
Shipping	\$5.00
Total Price	\$101.65


Submit Order

Daisy A Jewelry - A Chdsen Lassiter Production

## 6. Order confirmation!



[Home](#) [Contact](#) [About](#) [Products](#)



Home > Cart > Checkout > Order Confirmation

Order Confirmation


Thank you, your order has been received!

Your Order Number is 10


Instructions for sending in your personal item(s) has been sent to the email address provided. If you did not receive the email, (check your junk mail!) please contact me [here](#).  
Once your items are received, we will send you a confirmation of receipt!

Daisy A Jewelry

7. Site owner dashboard – realistically, I will have a login for the site owner to be able to access this, but for now it's a link at the bottom of the home page. This is the first thing I'm going to work on after the class – authentication and authorization to allow log-ins / accounts. The dashboard allows the site owner to query all orders from the backend by selecting one of the options (query all, open orders, by order id or customer id). The dashboard also allows the user to update components of the order such as the order status, ship date, order notes – where any changes made are sent to the backend and updated within the database.



[Home](#)[Contact](#)[About](#)[Products](#)



Home > Order Dashboard


Site Owner Dashboard

Show All OrdersShow Open Orders


Search by Order IDSubmitSearch by Customer IDSubmit

Order ID	Customer ID	Order Details	Order Date	Order Status	Ship Date	Order Notes	Order Amount Pre Tax And Shipping	Shipping	Tax	Total Order Amount
1	1 +/-	+ / -	Thu Aug 07 2025 12:23:48 GMT-0400 (Eastern Daylight Time)	Current Status: Complete	08/14/2025		\$150.00	\$5.00	\$10.85	\$170.85
2	2 +/-	+ / -	Thu Aug 07 2025 12:25:49 GMT-0400 (Eastern Daylight Time)	Current Status: Open	mm/dd/yyyy	Reached out to Customer for clarification on order	\$255.00	\$5.00	\$18.20	\$283.20
3	3 +/-	+ / -	Thu Aug 07 2025 12:29:33 GMT-0400 (Eastern Daylight Time)	Current Status: Open	mm/dd/yyyy		\$460.00	\$5.00	\$32.55	\$502.55
4	4 +/-	+ / -	Thu Aug 07 2025 13:09:50 GMT-0400 (Eastern Daylight Time)	Current Status: Complete	08/10/2025	Shipping # is 123456789	\$80.00	\$5.00	\$5.95	\$95.95
5	5 +/-	+ / -	Thu Aug 07 2025 22:28:51 GMT-0400 (Eastern Daylight Time)	Current Status: Open	mm/dd/yyyy		\$90.00	\$5.00	\$6.65	\$106.65
6	6 +/-	+ / -	Thu Aug 07 2025 22:46:23 GMT-0400 (Eastern Daylight Time)	Current Status: Complete	08/10/2025		\$470.00	\$5.00	\$33.25	\$513.25
7	7 +/-	+ / -	Sun Aug 10 2025 13:17:27 GMT-0400 (Eastern Daylight Time)	Current Status: Complete	08/10/2025		\$60.00	\$5.00	\$4.55	\$74.55
8	8 +/-	+ / -	Sun Aug 10 2025 14:27:25 GMT-0400 (Eastern Daylight Time)	Current Status: Complete	08/10/2025		\$120.00	\$5.00	\$8.75	\$138.75
9	9 +/-	+ / -	Sun Aug 10 2025 22:15:02 GMT-0400 (Eastern Daylight Time)	Current Status: Open	mm/dd/yyyy		\$305.00	\$5.00	\$21.70	\$336.70
10	10 +/-	+ / -	Mon Aug 11 2025 19:59:44 GMT-0400 (Eastern Daylight Time)	Current Status: Open	mm/dd/yyyy		\$90.00	\$5.00	\$6.65	\$106.65

8. Site owner dashboard – here I've filtered for open orders and one can see that Mister Ghost's order and all relevant details are safely stored within the database!



[Home](#)[Contact](#)[About](#)[Products](#)



Home > Order Dashboard

Site Owner Dashboard

Show All OrdersShow Open Orders

Search by Order IDSubmitSearch by Customer IDSubmit

Order ID	Customer ID	Order Details	Order Date	Order Status	Ship Date	Order Notes	Order Amount Pre Tax And Shipping	Shipping	Tax	Total Order Amount
2	2 +/-	+ / -	Thu Aug 07 2025 12:25:49 GMT-0400 (Eastern Daylight Time)	Current Status: Open	mm/dd/yyyy	Reached out to Customer for clarification on order	\$255.00	\$5.00	\$18.20	\$283.20
3	3 +/-	+ / -	Thu Aug 07 2025 12:29:33 GMT-0400 (Eastern Daylight Time)	Current Status: Open	mm/dd/yyyy		\$460.00	\$5.00	\$32.55	\$502.55
5	5 +/-	+ / -	Thu Aug 07 2025 22:28:51 GMT-0400 (Eastern Daylight Time)	Current Status: Open	mm/dd/yyyy		\$90.00	\$5.00	\$6.65	\$106.65
9	9 +/-	+ / -	Sun Aug 10 2025 22:15:02 GMT-0400 (Eastern Daylight Time)	Current Status: Open	mm/dd/yyyy		\$305.00	\$5.00	\$21.70	\$336.70
10	10 +/-	+ / -	Mon Aug 11 2025 19:59:44 GMT-0400 (Eastern Daylight Time)	Current Status: Open	mm/dd/yyyy		\$90.00	\$5.00	\$6.65	\$106.65

First Name	Last Name	Address 1	Address 2	City	State	Country	Zip Code	Phone	Email
Mister	Ghost	1234 Meowmies Lane	Apartment 1	Jasper	Indiana	Usa	47546	612-888-5555	Ghost@iKitty.Com

Product	Order Quantity	Metal Type	Size	Extended Price	Order Notes
Bracelet	3	Antique Bronze	6.5	\$90.00	I Would Like To Add Flowers To The Bracelets

Daisy A Jewelry - A Childsea Lassiter Production