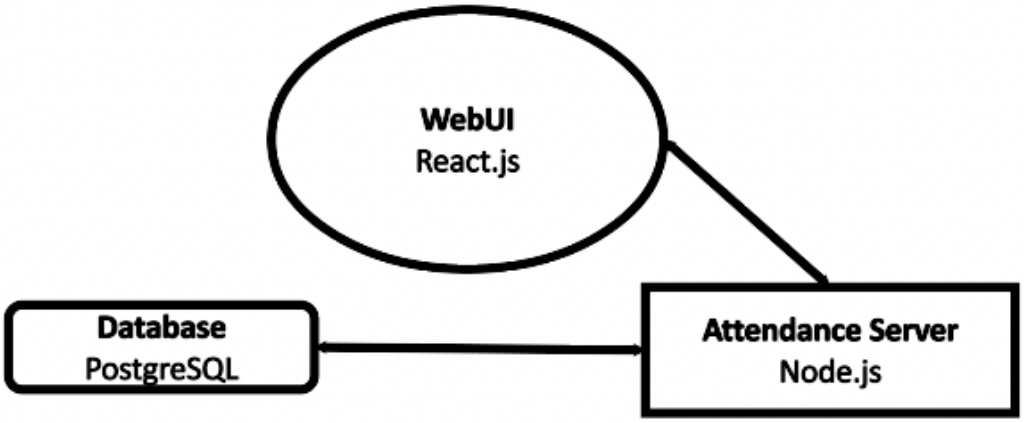
Attendance Tracker Technical Report

By: Josue Camilo, Danielle Rivas, Kyara Scott, Long Vu, Jackson Wertz

Summary:

Our team came up with the idea of creating a web-based attendance tracker that instructors could use in their courses. Professors and students would need to sign up for an account, but an added feature of the professors account is that they can create a code for the students to use to check in for attendance. Eventually we would like to only allow professors to register and then allow them to create accounts for all of their students to ensure that students are actually in the professor's course. Professors will also be able to view all of the attendance counts. Every time students physically attend class, they would have to log in from a computer(or any smart device). The generated code from the professor is to ensure that students are actually in class and do not sign into class more than once per session. Since the attendance tracker is a web application, we are using a simple user interface using ReactJS so the users can navigate with ease. We also have a working database (using postgreSQL) to store all of our users' general information, passwords, and total attendance tallied, which can also deny access to users who enter invalid passwords. From this database, users will be able to access their own personal records to ensure the information is correct. We connected the front end interface with the backend database using JavaScript with React. Though there have been some struggles regarding our Javascript code as well as trying to run our project via docker and kubernetes, the overall development process has been a steady progress. In the end we were able to implement everything: frontend, database, docker, kubernetes, and jenkins.

Chapter 1: The Vision



For this project, our team's idea is to make an Attendance tracker. Our vision for this project is to have a working login page and register page. Obviously users would log in on the login page to access the attendance tracker. And the register page would allow for user or professor registration. This needs to be done with javascript. The user will be able to log in everyday and mark their attendance. The user needs to have their username and passwords verified when logging in. When the user logs in, there will be a counter for the amount of times they have checked in and the result will be saved to the database. Users should also be able to view their up to date attendance count (The admin will also have access to this information). This database will be connected to a cloud service. Through this, the admin can view the calculation of the attendance of each user. Users are not allowed to sign in as someone else, each user will have their own login information.

When using the attendance tracker the first step will be to log in. This will go to the database and if the username and password matches to one found in the database it will allow the user to enter the attendance tracker. At this point the user will be able to “check in” to class by clicking on a button. By doing so the information will be sent to update attendance stats (as well as the data already in the database) in order to update the attendance statistics. Once these new statistics are created they will be sent to the database to be stored and displayed to the user. The stored account information of the student will also have their current attendance count. The attendance data will be available to the student/professor. As stated previously the admin(professor) will be able to see all users' attendance as well as be able to delete users from the log in database.

Chapter 2: Technical Requirements

The front end of the project or **WEBUI** will be what the user sees when they are logging in and after they have logged in. This will prompt for their username and password. (A bad user name or password warning will pop up if a bad entry is entered). After logging in, the user will be sent to a mainpage. The user will also be able to see their previous entries on another page. The amount of times checked in, username/password and name for each user will be stored in the **Database.** As of right now we are using **postgreSQL**. In the Backend, the admin will have access to every user's information, the user's calculated attendance score, and eventually have the ability to create or delete new users. Whereas the users can only view their own information without the ability to add or create new users. For the backend we plan to implement this using Javascript.

(Update) The front end will dominantly be written in html, css, and javascript and use ReactJS to assist with the creation. We plan to use html and css to format a login page that has a username and password boxes and the option to register for an account if the user does not already have one. To verify the user's username and password when logging in, it will be done by javascript calling the database, querying for a valid user, and returning if the user is valid with correct credentials, invalid password, or username unfound. When someone decides to create a new user, it needs to be done with javascript. The frontend javascript will need to call the backend using apollo graphql in order for this to happen. While the user wants to view their times checked in and attendance percentage (The admin will also have access to this information), this will be done from Javascript calling a request to the backend.

Chapter 3: Intermediate Milestones

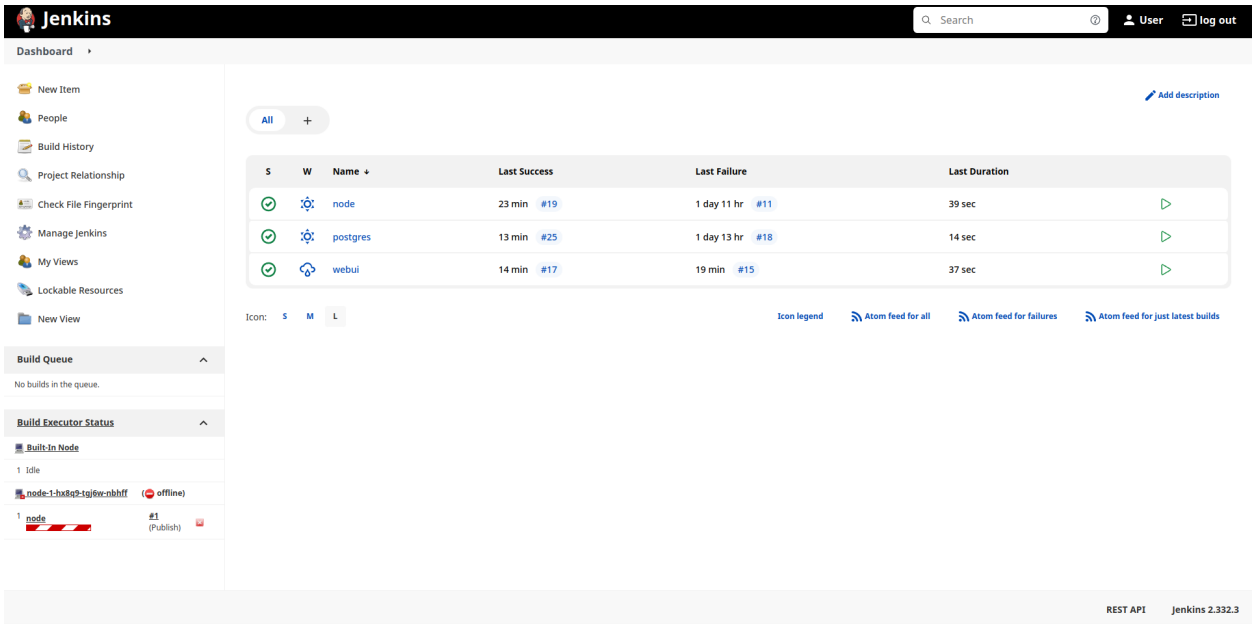
As of April, we have made a considerable amount of progress on our project. The front end of the project is close to completion. We were able to get a login page completed, a main page, and an account page up. For this part of the project, we mostly used HTML and CSS. Our plan is to have the user login with their username and password. Once logged in, they will see a main page which will contain a button to click in order for the student to log their attendance. The user will also have the ability to see their account information, like name, username, and how many days they have marked their attendance in. The Professor will also have the ability to log in on their side. On their side, they will have the ability to delete users and generate the day's code as well as view the attendance count of all students.

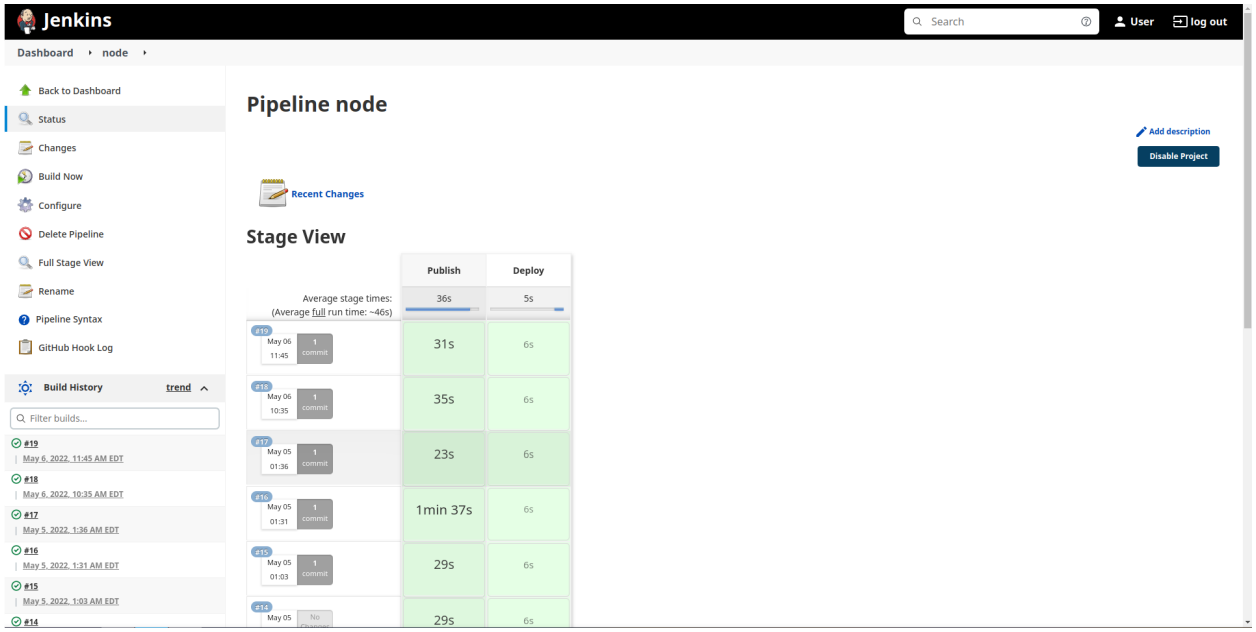
The main struggle that our group is attempting to tackle is setting up our project in docker and kubernetes. The dockerfile has to contain all the setup commands and the port setup for the external ports of the Kubernetes pod as well as the internal port openings for each docker container. We're also experiencing trouble getting the Javascript piece of the front end ready to run. When logging in, the Javascript section will be utilized to verify the user's username and password. It will also customize the user’s account page. It is the portion that will list every user’s unique username, name and how many days they have marked their attendance. However, an accomplishment we have made is with the database. We were able to create a database using PostgreSQL. The database is able to hold a user’s name, their username, and password. The username also has to be unique. If someone is registering a new user with a username already in use, they will not be allowed to do so. One person has the database up and running on docker. Two people have the front end up and running with the database on their devices.

Chapter 4: Final Report

As the semester comes to a close, we have finally figured out the Kubernetes and Jenkins pipeline and have each of our nodes separated and functional. However, since we have been focusing on cloud deployment, our overall functionality of the application is lacking. That being said, our group believes that we accomplished a lot with this assignment. Down below are some screenshots of our finished project along with our self evaluation of each section too.

Here are some screenshots from our Jenkins pipeline. Each of our nodes is running separately on Kubernetes and each node is connected to the Jenkins pipeline. The GitHub webhook also works so that when a new push has been made there Jenkins will automatically rebuild the component.

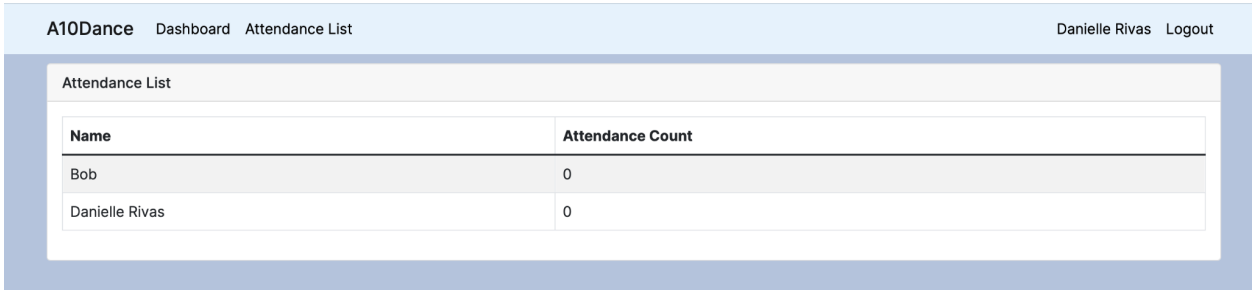




This screenshot shows the Jenkins deployments and pods up and running properly.

```
LV930939@head:~$ kubectl get deployments -n jenkins
NAME       READY   UP-TO-DATE   AVAILABLE   AGE
jenkins    1/1     1            1           43h
node       1/1     1            1           35h
postgres   1/1     1            1           37h
webui      1/1     1            1           80m
LV930939@head:~$ kubectl get pods -n jenkins
NAME                        READY   STATUS    RESTARTS   AGE
jenkins-5bf8d67f6c-swzhz    1/1     Running   0          43h
node-75dbc94c86-r7fgl       1/1     Running   0          25m
postgres-6697c5c748-2g7dj   1/1     Running   0          34h
webui-6886ff9ffd-djztk      1/1     Running   0          15m
LV930939@head:~$ kubectl get services -n jenkins
NAME           TYPE        CLUSTER-IP       EXTERNAL-IP   PORT(S)           AGE
jenkins        NodePort    10.106.105.99    <none>        8080:30000/TCP    43h
jenkins-jnlp   NodePort    10.101.202.156   <none>        50000:50000/TCP   43h
node           NodePort    10.103.25.220    <none>        4000:40000/TCP    35h
postgres       ClusterIP   10.111.149.90    <none>        5432/TCP          37h
webui          NodePort    10.107.19.72     <none>        80:30080/TCP      78m
```

Here is a screenshot of our WebUI that shows that the database is connected to the WebUI. There are some functionality improvements and missing data fields that could be fixed in the near future such as the attendance code system.



Overall our project met all of the technical requirements of creating a web application (in our case the WebUI and database) with cloud deployment. We were able to use a combination of Docker, Kubernetes, and Jenkins to complete our cloud deployment. As for our WebUI we accomplished a great deal but as previously said we did face some functionality incomplete towards the end that we did not have time to implement. But we have a working registration and log in page as well a display of the attendance list and account information. We truly believe that if given a little bit more time A10Dance could be great enough to be an application with widespread use.

JOSUE CAMILO

West Reading, PA
josue.raf.camilo@gmail.com |

EDUCATION:

West Chester University **West Chester, PA**

College of the Sciences and Mathematics | Bachelor of Science in Computer Science *Graduation: December 2022*

Computer Security Certificate

RELEVANT COURSES:

CSC 141: Computer Science I
CSC 142: Computer Science II
CSC 220: Foundations of Computer Science
CSC 231: Computer Systems
CSC 241: Computer Science III
CSC 241: Data Structures and Algorithms
CSC 301: Computer Security & Ethics

Reading Area Community College **Reading, PA**

August 2017 – December 2019

RELEVANT COURSES:

IFT 100: Intro to Information Technology
PRG 100: Intro to Computer Programming (C++)
WEB 100: Web Design I-HTML
NET 100: Computer Networking
CSC 241: Data Structures and Algorithms
PRG 260: Database Systems

SKILLS:

Languages: Java, C, C++
Technologies: Eclipse, NetBeans, Visual Studio, GitHub, Linux, SPSS, Microsoft Office

PROFESSIONAL EXPERIENCE:

University Student Housing **West Chester, PA**

Front Desk Assistant *January 2022- present*

- Support the USH staff by effectively and efficiently performing administrative responsibilities as assigned.
- Managed package intake and distribution to residents, while also ensuring resident safety and security at all times.
- Assisted in opening and closing the building.

Make the Road Pennsylvania **West Reading, PA**

Development & Communications Associate *May 2020 – January 2021*

- Assisted with fundraising events, social media, digital organizing, and data maintenance during election season.

GIANT Food Market **West Lawn, PA**

Grocery Associate *July 2018 – January 2020*

- Answered questions related to merchandise. Applied customer service skills during customer assistance.
- Received, opened, unpacked and issued sales floor merchandise.

EXTRACURRICULARS:

Cybersecurity Club **West Chester University**

Member September 2021 - Present

- Learned common industry tools to utilize in the field (e.g.,Wireshark, VeraCrypt, and Kali Linux).

- Honed in on cyber security discussions and related events associated with the future of the industry.

Danielle Rivas

3412 Portland Drive
Whitehall, Pennsylvania 18052
daniellejrivas@gmail.com • 610-554-9159 (mobile)

EDUCATION:

West Chester University of Pennsylvania, West Chester, Pennsylvania **Expected graduation date: May 2022**
Bachelor of Science in Computer Science
Minor in Applied Statistics
Computer Security Certificate
GPA 3.72/4.0

West Chester University of Pennsylvania, West Chester, Pennsylvania **Expected graduation date: May 2023**
Masters of Science in Computer Science
GPA 3.65/4.0

RELEVANT COURSES:

- Operating Systems
- Data Communications and Networking
- Data Structures and Algorithms
- Computer Security I
- Foundations of Computer Science
- Software Engineering
- Computer Systems
- Software Security
- Discrete Mathematics

TECHNICAL SKILLS:

- JAVA, Swift, React, OCaml
- HTML/CSS
- Python, C, Rust (beginner)
- NetBeans, VS
- Xcode
- GitHub
- React
- Microsoft Word and PowerPoint
- Terminal- Linux

EXPERIENCE:

West Chester University, West Chester, PA **Facility Supervisor** **August2021– Present**
- Ensure that patrons are aware of and following the safety policies of the building
- Communicate between coworkers as well as patrons
- Collaborate with small and large groups of coworkers for training and shifts
- Supervise employees while on shift

Giant Food Stores, Allentown, PA **Customer Service Associate** **May 2020 - Present**
- Build customer and employee connections to ensure that everyone feels welcome
- Work as a second in command to the front end supervisor
- Actively follows policies and procedures to prevent fraud
- Navigate multiple tasks at once in a fast pace environment

Whitehall Township, Whitehall, PA **Camp Counselor** **June 2019 -August 2019**
- Cared for elementary aged children in a fast pace environment
- Communicated regularly between coworkers, supervisors, children, and parents
- Ensured a safe and fun environment was maintained at all times
- Engaged in teamwork between coworkers.

LEADERSHIP:

Women in Computer Science Club	Vice President	**May 2020– Present**
Hands Helping Paws	Volunteer Coordinator	**May 2020 – Present**

VOLUNTEER EXPERIENCE:

- **Brandywine Valley SPCA,** West Chester, PA
- **The Sanctuary at Haafsville,** Breinigsville, PA
- **SkillsUSA Council,** Allentown, PA
- **Dakota Galusha Memorial Fund,** Northampton, PA

Kyara Scott

scottkyara77@gmail.com · 610-308-4153 (mobile)

Objective: Seeking employment where I may not only use my skills in Computer Science and leadership to help the company grow, but to further my skills and experience.

EDUCATION:

West Chester University of Pennsylvania **Graduation: May 2022**
Bachelor of Science in Computer Science
Cybersecurity Certificate
Minor in Japanese and Chinese (Mandarin)
GPA 3.69/4.0

RELEVANT COURSES:

- Object Oriented Programming
- Data Structures and Algorithms
- Computer Systems
- Computer Security I & II
- Software Security
- Software Engineering

TECHNICAL/NON-TECHNICAL SKILLS:

- Netbeans, Eclipse, VS
- GDB
- Agile and Scrum
- GitHub and Bitbucket
- Jira, Confluence, Jenkins
- C, JAVA, Python, ML, Assembly

PROJECTS:

Tools for L3 Harris Technologies **Software Engineer Intern** **June 2021 - August 2021**

- Collaborated with a team of engineers to build a tool for L3 Harris Technologies to analyze their Aviation systems.

Attendance Tracker **Programmer** **January 2022 - May 2022**

- Created a Webui with javascript and react.
- Implemented a cloud based attendance tracker with Docker, Kerbernetes and Jenkins.

EXPERIENCE:

L3 Harris Technologies, Herndon VA **Software Engineer Intern** **June 2021 - August 2021**

- Intern for two FAA NextGen Airspace Modernization Programs where I developed applications in C to characterize system performance by analyzing air-traffic and weather data and troubleshooting for missed uplinks between ground stations and ADS-B equipped aircraft.
- Collaborated with a small team to plan sprints and assign tasks to each member.

Weis Markets, East Norriton, PA **Sales Associate** **May 2020 - January 2021**

- Advising the best and most fresh products to customers to ensure a quality sell.
- Ensuring freshness of product by checking their date of and donating extra products to charity.
- Organizing the next day's layout needed: preparing the breads for baking in the morning.

LEADERSHIP:

Japanese Club **Treasurer** **May 2020 – May 2022**

- Responsible for organizing and financing events for the club
- Manage the club's finances to make sure we never went over budget on purchases

ACTIVITIES/AWARDS:

- **Awarded Board of Governors Scholarship** **March 2018– Present**
- **Japanese Tutor** **September 2021- Present**
- **Upsilon Pi Epsilon** **April 2022 - Present**

Long Vu

+1 (267) 424-5186 | hi@vulongm.com | github.com/vulongm | linkedin.com/in/vulongm

Education

West Chester University of Pennsylvania | West Chester, PA GPA 3.47
Master of Science in Computer Science August 2022 — May 2023
Bachelor of Science in Computer Science August 2019 — May 2022

- Minor: Geographic Information Systems (GIS), Certificate: Computer Security
- Dean's List: May 2020

Skills

Languages: JavaScript, Python, Java
Technologies: React.js, Git, Node.js, Docker, Kubernetes, Linux, GraphQL, PostgreSQL, ArcGIS

Experience

West Chester University
IT Helpdesk Consultant February 2022 — Present

- Support the university's operations with the provision of hardware and software
- Troubleshoot and resolve issues across the university's infrastructure

Lionbridge
Desktop & Mobile Search Reviewer February 2019 — July 2019

- Evaluated product quality and accuracy to improve user experience across the US

Projects

Library System January 2021

- Created a frontend site that used React.js with Redux and JavaScript
- Wrote a backend server with Node.js, Apollo GraphQL, Express, and MongoDB
- Built a mechanism to create/login to an account, add/update and view list of books

Involvement

Game Development Club | West Chester University
President and Founding Member October 2021 — Present

- Organize the executive board, created a club constitution, and handled recruitment of new members to build the club from scratch
- Manage social media accounts and student conversation spaces
- Run weekly club meetings for members to learn about current industry news and participate in workshops which include ways to approach art and different game engines

Cybersecurity Club | West Chester University
Member February 2021 — Present

- Participate in the discussion of cybersecurity related topics about current events
- Navigate tools used in the space such as VeraCrypt and Wireshark

Competitive Programming Club | West Chester University
Member January 2020 — Present

- Participated in The 2021 ICPC North America Qualifier and The 2021 ICPC Mid-Atlantic USA Regional Contest
- Regular practice to solve programming problems from UVa OnlineJudge, LeetCode and Kattis

Computer Science Club | West Chester University
Member August 2019 — Present

- Hosted a presentation and workshop on GitHub and git commands
- Learn about various practices such as unit testing in the industry from guest speakers and other students

Jackson Wertz

25 Krauser Road | Downingtown, PA | 19335 |
(484) 340 7764 | jackson.wertz1205@gmail.com

Motivated student who demonstrates a strong work ethic and excellent problem-solving skills. Seeking to apply my experience and passion for software development at a summer internship where I can grow as a person, learn more about the industry, and create an ever-lasting impact that is greater beyond myself.

Education

West Chester University | 2019 – 2023
Bachelor of Science in Computer Science | West Chester, PA
Certificate: NSA/ABET Computer Security Certificate
Dean's List: Fall 2020, Spring 202

Relevant Coursework:

- CSC 141-240: Computer Science 1-3
- CSC 231: Computer Systems
- CSC 241: Data Structures and Algorithms
- CSC 335: Data Communications and Networking
- CSC 345: Programing Languages
- CSC 402: Software Engineering
- CSC 472: Software Security

Skill Summary

Programming Languages: Java, C#, C, Python, Ocaml
Technical: Github, Windows, Terminal, Computer Building, Maintenance, Troubleshooting, UML, virtualization platforms (VirtualBox), Understanding of basic network protocols, and Unity Game Development Software

Previous Work Experience

Giant Food Stores: Front End Cashier | Summer 2021 – Still Employed
Technical: Learned how to work as a team and solve problems, while also delivering optimal customer service in a fast paced environment.

Personal Projects

Text-Based Blackjack Game | 2018 | Coded in Java

- Inspired by Fallout: New Vegas's Blackjack Table
- Used Advanced Object-Oriented Programing and Data Structures to simulate a deck of cards being shuffled and drawn from

Simple Legend of Zelda | 2019 | Coded in C#

- Simple Game created with Unity Game Development Software
- Used C# scripts and Unity Engine, including hitboxes, collision triggers, and physics, to make a simple multilevel *Legends of Zelda* game