Group 3's Balance Transfer Web Application

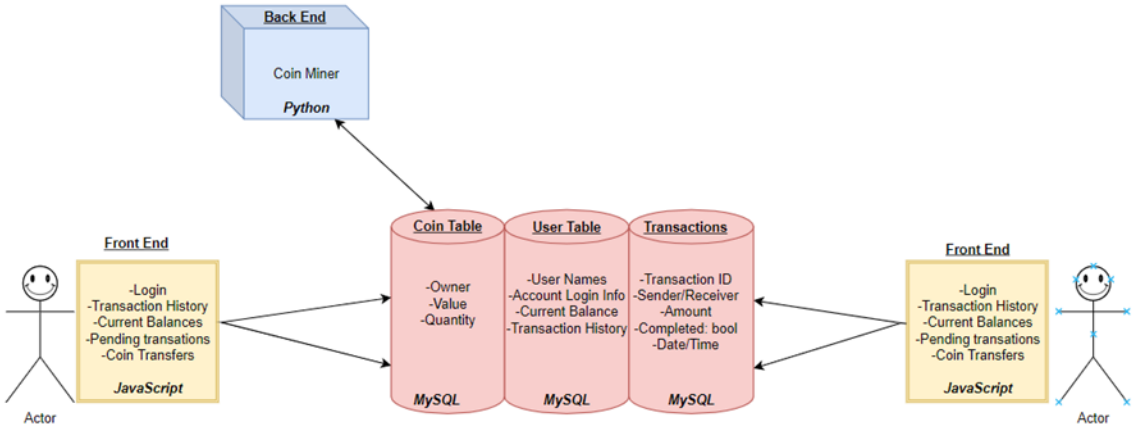
Declan Teofilak, Meredith Urban, Shomari Turner, Collyn Gregory, Patrick Ryan

---

CSC 468-01 Introduction to Cloud Computing

Professor Ngo

Balance Transfer Diagram



Project Summary

Our team is envisioning a 24/7/365 best-of-breed coin trading and generating website that allows the user to log in to an account, view previous transactions, and their account balance, and send money to other registered users, whilst generating new coins with the provided coin miner. The reason why we picked this project is to reflect what's happening in our world today and focus on empowering users with a service that allows them to cooperate on a cloud-based level quickly and synergistically; a way to create efficiency in today's diverse, globalized environment.

Here are our action items: We will create a seamless front-end that holistically utilizes Javascript, HTML, and CSS to provide a simple but intuitive user face experience. The database will have three tables, "Transactions", "Users", and "Coin Types". When the user logs into the site, there will be a listing with their current account balance and a customizable summary number of recent transactions. Beyond that, a menu icon will be available with options to change their password and view a separate detailed transaction page. The interface for performing that transaction will again aim for ease of use and simplicity, with a text box to choose the user, and a text box to choose the amount to send. Features that could be added would be user statistics, "friending" certain users for quicker transactions, and visualizing market trends for the currency the user has.

Technical Requirements

Front-End

The front end will remain written in Javascript. The idea would be that the user can trigger events that post back directly to the database. The database would post and verify whether the coins are there/the user exists, and then store the transaction. The front-end would also effectively handle the actual trading of the coins. One user will request a trade from another, causing the user on the receiving end of the trade to be notified that the trade is pending. If the user accepts the transfer, the database records the transactions. It may be possible to set a time limit on valid pending requests, to account for changes in the market value of the coin. The result will aim to simulate popular applications such as Zelle or CashApp, but in a more straightforward manner and with a self-contained digital currency.

Back-End

Our back-end element will be a reworked version of the given coin miner program, which will be responsible for creating the digital coins traded in the market. The digital coin aims to mimic cryptocurrency, and thus the value of the coin may fluctuate based on trading frequencies. The back-end code will be re-written in Python. Most of us have at least familiarity with it, if not a lot of exposure, and it works well with MySQL. Additionally, Python is one of the easiest languages to get a code up and running, making it a great choice for prototyping. Something that may be beyond the scope of the project would be proper password security, location data, and live updates (where a simple post back from the page wouldn't suffice).

Database

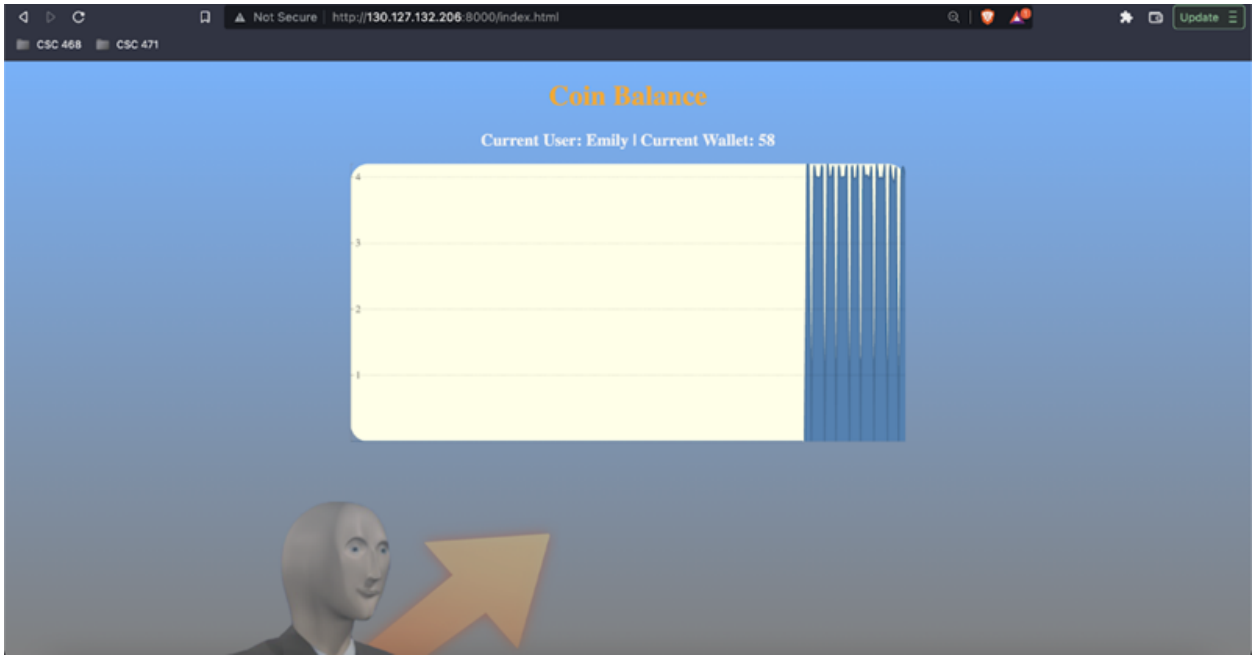
Initial research makes it seem that a rewrite into MySQL is likely our best bet for the database portion of the project. The User table will hold the user's first and last names, usernames (userID), passwords, coins attached to the user, current balance, and transaction history (pending/completed transactions). The Coin Type table will hold the number of coins, the value of the coins, and the coins attached to the user. The Transaction table will have pending transactions, completed transactions, a transaction ID, the sender, and receiver (userID), the amount that was transferred, and the date and time of the transfer. The database will use MySQL to implement the necessary data to interact with the front and back end.

Intermediate Milestones

When initially reporting our intermediate findings the scope of our idea became unwieldy. The project's learning curve of managing Docker, Kubernetes, the intermediate services, and changing the actual project to function as we intended was beyond what we had originally determined it to be. Our team has successfully launched instances of what would be the project via in-class exercises, but the major step of fully implementing a new database structure, recreating a new front-end that allowed for

user authentication, and ensuring that we could still deploy it and manage it proved to be difficult from our repository. The compromise is that our project will now allow for the end-user to specify who they are (or conversely whose “wallet” they want to view). When they enter this single credential (we decided to forgo a password system since the complexity would not be worth the trouble for a read-only system) they can view and monitor the specified wallet. The goal from here is to ensure that the front-end is communicating properly with the backend to spin up a table and write to that specific table, and then allow another user to access the same table if the instance persists. Our team decided that a stretch goal for the project would be to allow for the contents of the database to be written to a file, that way the contents of the wallet aren’t lost when/if the server instance goes down. We agreed upon these new terms and continued working on the project.

Eventually, we were able to get the repository cleaned up and had a functioning login system but the task still proved challenging. Our team has had scheduling issues, and while remote work on this project is possible it is not preferred since the scope and topics of this project are beyond any of our expertise. While we considered scaling back our overall approach to this project, ultimately, we had a breakthrough towards the beginning of April and were able to get the project further along than we had initially thought. We have been able to implement the provided Docker and Docker Compose files with augmentations to work with our repository. As of this writing, we are currently able to launch from our project repository from Cloudlab, clone our main branch, build via docker-compose and run our project. Additionally, we have been able to manage the containers via Kubernetes. We did run into a few errors, namely a CrashLoopBack error when deploying to Kubernetes. This issue was difficult to remedy, but after debugging the code and manifests, we were able to find that our Redis version was dependent on a newer version of node. Initially, we tried to update the node, but this proved difficult and cumbersome, and we realized that the simpler solution of downgrading Redis to match our version of the node was the better approach. This worked and led us to have a fully up-and-running project repository. To this point, the project is accessible via the head node’s IP Address and the port we assigned to the “WebUI” service. Below is a screenshot of the updated “Coin Balance” webpage.



The page now displays the current user and their wallet total. This total is a proof of concept, however, as we have not currently implemented a way to write the wallet totals to a file. This should be straightforward, and we have ideas started on our local machines, but nothing that would be worth demonstrating at this point. The final goal has been adjusted slightly, as we have decided to use a file reading system in the web UI to communicate wallet totals. This change will allow us more time to work on the CI/CD aspect of the final project deliverable which we believe should take precedent. The final page will have the ability to view the total coins earned in the current session (when you last logged in through to now) and log out. Upon log-out (or redirecting to another page) all users will have their wallets written to a file stored locally in the web UI directory. This should create a sufficient method of tracking the individual coins mined. Beyond this, it may reintroduce the ability to initiate coin trades. This was our initial goal for the project, and while we are happy with the current pace and structure, being able to potentially return to that goal is exciting. While we had also planned to make considerable changes to the database, we realized that the functionality we desired was attainable through the method above. Going forward our number one priority will be adding a read/write files system for the javascript implementation, and from there the secondary “stretch” goal will be to create a transaction system. Finally, since these changes have come late in the project, we have decided to rename the project. The project is now “Coin Balance” as it more accurately reflects what we are currently able to do.

Self-Assessment

Our group was able to implement some of the goals we set previously. We can deploy our git repo through the Jenkins pipeline by using the branch k8-jenkins. There is now a logout function added to the web UI; previously, when switching users, the same number of coins would display and continue to

increase no matter which user was logged in. With the logout function, users will be able to keep the coins that they had mined in their previous session whenever they decide to log out. Users are now able to trade coins to different users through the web UI. There are some things we could not implement in the final version of the project. We wanted to add a SQL database that held user data, coin balance, and transactions between users. Unfortunately, we did not have enough time to add the SQL database the way we wanted. When starting, we added the SQL database to the docker-compose.yml file, but a problem our group had was that the commands we entered were not recognized. After downloading the necessary MS SQL commands, the database did not connect to the Jenkins pipeline. Certain files in the main branch were not used in the k8-jenkins branch. The final project is using Redis as a database. Our group has minimal knowledge of SQL and other databases, web UIs, and cloud computing, but we were able to complete most of our goals and finish the final project.

Collyn Gregory

Church St, West Chester, PA 19382

collyn.r.gregory@gmail.com

PROFESSIONAL SUMMARY

Soon-to-be graduate with a BS in Computer Science and several years of experience working in both Java and C#. Proficient in Photoshop, Blender, and Unity Engine. Currently looking to become a game developer or software engineer.

EDUCATION

West Chester University of Pennsylvania, West Chester, PA

Bachelor of Science, Computer Science, May 2022

Boyertown Area Senior High, Boyertown, PA

High School Diploma, May 2017

EMPLOYMENT HISTORY

Sales Associate, Sherwin-Williams. West Chester, PA

Feb. 2021 - Present

- Suggest specific product purchases to meet customers' needs.
- Sell products being promoted and keep records of sales.
- Keep areas neat while working and stock items in correct locations.
- Respond to customers' questions and complaints.

- Arrange shipping of merchandise as well as necessary documentation.

Courier, DoorDash. West Chester, PA

Oct. 2019 - Feb. 2021

- Obey traffic laws and follow established traffic and transportation procedures.
- Safely and efficiently transport food items within a given amount of time.

Manual Labor, CJ Robinson. East Greenville, PA

May 2018 - Jul 2018

- Loading and unloading pallets of wax.
- Wrapping pallets & arranging delivery paperwork.
- Pulling slabs of wax out of molds.
- Cleaning spilled wax & other factory debris.

Sales Associate, Manatawny Green Mini Golf. Pottstown, PA

May 2017 - Oct 2017

- Cook and prepare food items, such as sandwiches, hot dogs, and ice cream dishes.
- Perform cleaning duties such as sweeping, mopping, and washing dishes, to keep equipment and facilities sanitary.
- Brew coffee and tea, and fill containers with requested beverages.
- Accepting payment and/or making change using a cash register.
- Groundskeeping

SKILLS

- **Blender**
- **Unity Engine**
- **Photoshop**
- **Python**
- **C#**
- **Java**

pr921337@wcupa.edu | 484-612-3937

PROFESSIONAL SKILLS AND INTERESTS

- **Social Engineering**
- **Copywriting**
- **Neuro-Linguistic Programming**
- **Persuasion**
- **Conversational Hypnosis**

EDUCATION

B.S. Computer Science. West Chester University (West Chester, PA)

- Overall GPA: 3.52/4.0
- Expected Graduation: Spring 2022

PROFESSIONAL SKILLS DEMONSTRATED

Content Marketing – Stock Spinoff Investing

Oct 2021 – Present

Investment research company focusing on spinoffs.

- Wrote twitter threads about special situation investing
- Created $36,000 in new yearly recurring revenue in six months (~36% increase in ARR)
- Responsible for 976 new Twitter followers (~25% increase in followers)

GoPuff - Delivery Driver

March 2021 – Present

A food delivery service

- I hold the fastest delivery speeds at multiple locations (*despite the fact* that I drive a Prius)
-

Declan Teofilak

Computer Science

123 Your Street
Your City, ST 12345
(123) 456-7890
teofilakdeclan@gmail.com

Computer science graduate with a desire to learn. Searching for challenging, engaging, and fulfilling projects to be a part of and share my expertise with.

EXPERIENCE

Endevor LLC, Delaware - *Software Developer / Data Analyst Intern*

May 2020 - PRESENT

- Front and Back-end web development using the Microsoft stack
- Engineered software solutions for the nuclear field including risk assessment software and issue accounting
- Developed under the Agile development process

Benjamin Lovell Shoes - *Pennsylvania- Sales Associate / Key Holder*

January 2018 - May 2020

- Worked directly with management to maintain the sales floor
- Opening and closing responsibilities
- Regularly lead the location in sales

EDUCATION

West Chester University of Pennsylvania - *Bachelor's of Science | Computer Science*

May 2022 - 3.79 GPA

West Chester University Dean's List of Science and Mathematics

AWARDS

Phi Theta Kappa Honors Society

SKILLS

Problem Solving

Critical Thinking

Intense Focus

Shomari Turner

Consideration in Technical Support Engineer

Lansdale, PA 19446
(XXX) XXX-XXXX
turnershomari98@gmail.com

EXPERIENCE

Planet Fitness-758 Allentown Rd, Lansdale, PA 19446

Front Desk Associate

May 2021 - Present

Responsible for providing a premium level of customer service, custodial duties, and greeting members .

Venture 3 Systems (dba: Telikin) - 2805 Sterling Dr, Hatfield, Pennsylvania 19440

Technical Support Associate

August 2020-February 2021

Responsibilities included enriching and improving the lives of customers by providing them phone-based support of Telling/Wow Computer, while also helping them learn how to use Web-based applications.

Montgomery County Community College, 340 DeKalb Pike, Blue Bell, PA — *Service Clerk*

February 2019 - December 2020

Responsible for providing clerical, data entry, and other tasks assigned for the Registrar Office.

Montgomery County Community College, 340 DeKalb Pike, Blue Bell, PA — *Student Ambassador*

November 2018 - December 2020

Volunteers, orchestrate, and lead students to events or resources on campus.

SKILLS

Responsible

Exceptional Customer Service

Remarkable Teamwork

Organized

Programing Languages

JavaScript

C

SQL

HTML/CSS

AWARDS

Certificate of Achievement:

Student Leadership

Symposium -Received in

February 2019

Certificate of Completion: Student Services Training Program -Received in May 2019

EDUCATION

North Penn High School, 340 S Valley Forge Rd, Lansdale, PA— *High School Diploma*

June 2016

Montgomery County Community College, 340 DeKalb Pike, Blue Bell, PA — *Certificate in Cyber Security*

May 2020

Description- provides graduates a solid foundation in data communications, router configuration, server operating systems, computer hardware and network security

Montgomery County Community College, 340 DeKalb Pike, Blue Bell, PA — *A.A.S in Computer Networking: CYBER SECURITY CONCENTRATION*

December 2020

Description- Prepares graduates with knowledge and skills in computer and network security, ethical hacking, computer forensics, data networking, and computer hardware and support.

Meredith Urban

meredithu915@gmail.com | (717) 639 6075

Education

West Chester University (Ant. Fall 2022) B.S. Computer Science, Minor in Applied Statistics *Current Cumulative GPA: 3.845*
Dean's List: Fall 2019, Spring 2020, Fall 2020, Spring 2021, Fall 2021
Upsilon Pi Epsilon member (Ant. Spring 2022)
Topics Studied:
Java Programming, Data Structures & Algorithms, Database Management, Software Engineering, Computer Security, Computer Systems, Code Refactoring, Programming Language Theory, Discrete Math, Calculus I, Statistics I and II, Simple/Multiple Linear Regression, Model Building

Topics for Spring 2022 include: Artificial Intelligence, Cloud Computing, User Interfaces, Technical Writing

Cedar Crest High School (2019) High School Diploma
Cumulative GPA: 4.035

Skills

Strong skills in Java
Experience with Python, SQL, R, C++, C, HTML/CSS, OCaml, IBM SPSS

Experience

Yogey's Miniature Golf and Ice Cream (May 2015-June 2019) Golf Attendant, Manager
Utilized scheduling, inventory, and security systems, performed customer service, communicated with staff via verbal and electronic methods.

Penn State Hershey Medical Center (May 2019-August 2021) Custodian
Coordinated with several teams to ensure prompt and thorough sanitization of various locations on campus.

Volunteer and Leadership Experience

Clinical Supply Volunteer **Good Samaritan Hospital** (2017-2019)

Leadership Intern **Camp Invention, National Inventors Hall of Fame** (2017-2018)

Section Leader **West Chester University Incomparable Golden Rams Marching Band** (2020)

Contrabassoonist **West Chester University Wind Ensemble/Symphony** (2021-present)

Bassoonist **West Chester University Wind Ensemble/Symphony, Concert Band** (2019-present)

Bassoonist **Pennsylvania Chamber Winds** (2020-present)