Report

# Project Programming language

I will be using C for this project.

# Environment

My environment is Ubuntu 22.04.4 LTS x86\_64. This environment is not virtualized, I am running it as its own OS on my dual-booted machine.

# Phase 1

## Objective

The main objective for this phase was to successfully create two threads that represent different banking transactions that a user can perform on a account that has a certain amount of money. But I took a slightly different approach. Instead of creating two threads that represent withdrawals and deposits, I created an array of size NUM\_THREADS that contains elements that can be either a withdrawal or a deposit. After that array was created, I made a struct that represents a user, which was used to create an array of users of size NUM\_THREADS. To simulate a user choosing to withdrawal or deposit from the account, I created another array called arrayOfChoices with a size of NUM\_THREADS. The arrayOfChoices can be filled with either a 1 or 0 representing a withdrawal or a deposit. To complete this phase there’s a for loop that runs from 0 to NUM\_THREADS. Each iteration there is a random value that is generated which represents how much money a user has and each user will get their own ID. The value that the for loop accesses in arrayOfChoices, will determine if the user will deposit or withdrawal, which is controlled by an if-else statement. The threads will only access two functions: withdrawalFunc and depositFunc. Both of these function would take in a void pointer, which would be set equal to a userData pointer. After casting, there are two variables used to obtain the data from the userData pointer variable. UserID and randWithDrawal.

## Challenges

I was struggling to understand void pointers and properly casting that pointer. In this case, it was casted to struct userData. I also was struggling how to obtain certain values from the struct after setting the void pointer equal to a userData pointer. There is different syntax used to point to certain values in a struct pointer variable.

## Solutions

I used stackoverflow to find an answer to my challenge:

<https://stackoverflow.com/questions/14946344/casting-a-void-pointer-to-a-struct>

and I also used a geeksForGeeks article talking about declaring a pointer to a struct:

<https://www.geeksforgeeks.org/how-to-declare-pointer-to-struct-in-c/>

## Outcome

Learned about threads, void pointers, structs and how to use them efficently.

# phase 2

## Objective

The main objective was to implement mutexes to prevent multiple accounts from accessing the account at the same time, not implementing this would lead to an inaccurate bank account value.

## Challenges

## Solutions

## Outcome

# phase 3

## Objective

## Challenges

## Solutions

## Outcome

# phase 4

## Objective

## Challenges

## Solutions

## Outcome

# Reflection