

Secure Online Banking System

User Guide

Group 13

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1 Overview of the User Guide

1.1 Purpose of the User Guide

This User Guide is designed to assist the online bank users, including bank employees and customers, to be familiar with the developed secure online banking system. Step by step, we will show each page and functionalities for different users. Moreover, the security features will be explained and described in detail to assure user's safety to use the online banking system.

1.2 How to Use the Guide

In chapter 1.3, the guide will describe the requirements to use the online banking system.

In chapter 2, an overview of the secure banking system will be introduced including the security features.

In chapter 3, the guide will describe the use for users with different roles, including tie-1 employ, tier-2 employ, tier-3 employee, customer and merchant. First of all, the login page, which is shared by all users, will be described. Then the user can look into different specific sections according to his/her role to grasp the design, feature and functionality of the user's subsystem.

If a user has any further question or concern, a technical help and support team can be reached at cse598group13@gmail.com.

1.3 Requirements

The secure banking system is deployed on AWS which has all necessary hardware to host the server. The user just needs a qualified operation system and browser to visit the server as a client.

A. Operating System Requirements

- ❖ Apple OS X or above
- ❖ Ubuntu 14.05 or above
- ❖ Microsoft Windows 7 or above

B. Browser Requirements

- ❖ Safari 6.2.9 or above
- ❖ Internet Explorer 10 or about
- ❖ Mozilla Firefox 40.0 or above
- ❖ Google Chrome 45.0 or above

2 Overview of the Secure Banking System

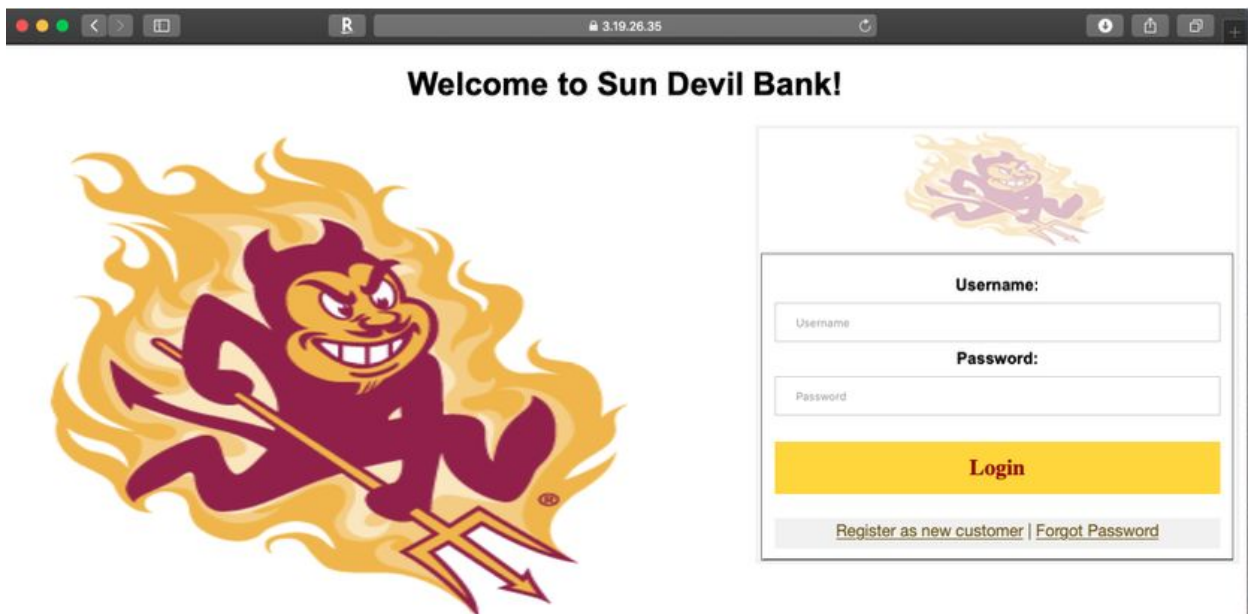
The secure banking system is hosted on a virtual machine and be 24*7 available to customers and employees online through a web browser. Two kinds of users are hypothesized to use the system, categorized as internal users and external users. The internal users can be classified into 3 groups with gradually higher privileges, i.e. tier-1 employees, tier-2 employees, and tier-3 employees. The external users include individual customers. Three kinds of accounts, i.e. checking accounts, saving accounts and credit accounts, are designed as in the real world. Basic functionalities are developed to allow users to create, view, modify, close accounts, debit, credit, and transfer money, request, grant and decline authorization, view log-in and transaction history or bank statement in a secure environment.

The system can be accessed at <https://3.19.26.35/>

3 Online Banking Interfaces

3.1 Login

Login page is the entry to the online banking system. Users including internal employees and external customers need to log into the system by entering his/her registered user name and password shown in Fig. 1. Once the credentials are validated, the user will be directed to the dashboard based on their role(customer, admin, tier-1, etc). So, all users, internal or external, associated with the bank shall login through the same page. Prospective customers who are interested in opening a new account can also register into the bank from this page.



The screenshot shows a web browser window with the address bar displaying 'R' and the time '3:19:26.35'. The page title is 'Welcome to Sun Devil Bank!'. On the left, there is a large cartoon devil mascot with a red body, yellow face, and a pitchfork, surrounded by orange and yellow flames. On the right, there is a login form with a header image of the mascot. The form contains two input fields: 'Username' and 'Password'. Below these fields is a yellow 'Login' button. At the bottom of the form, there are two links: 'Register as new customer' and 'Forgot Password'.

Fig. 1 Login Page

If this is your first time using the system, you can create your external user account information on the Registration Page (Fig. 2) by clicking the “Register as new customer” button on the Login Page. The required information includes Customer Type, Desired UserName, Email, Password, Name, Address, Phone Number, Date of Birth, SSN, City, Province, Zip Code. After inputting all the required blanks, you finish registering a new external user by clicking the “Register” button at bottom.

Registration

Customer Type
Select option

Desired UserName

Email

Desired Password

Confirm Password

First Name

Middle Name

Last Name

Address 1

Address 2

Phone Number

DOB

SSN

City

Province

Zip Code

What primary school did you attend?

In what town or city did your mother and father meet?

[Reset](#) [Register](#)

[Existing Customer Login](#)

Fig 2 Registration Page

OTP is sent by email if you want to reset your account password. The Forgot Password Page is shown in Fig. 3.

Forgot Password

User's name

[Request OTP](#)

[Go Back](#)

Fig 3 Forgot Password Page

3.2 Internal Users

There are 3 kinds of internal users, including Tier-1 employee, Tier-2 employee, and Tier-3 employee with increasing privileges.

3.2.1 Tier-1 Employee

The Tier-1 Employee's Dashboard is shown in Fig. 4-1. From the dashboard, tier-1 employee can approve/decline non critical transaction (<\$1000) as in Fig 4-2, create non critical transaction as

in Fig. 4-3, issue cashier cheque as in Fig.4-4, deposit cash cheque as in Fig. 4-5, deposit money as in Fig. 4-6, withdraw money in Fig. 4-7, view customer accounts in Fig. 4-8, change password in page 4-9, view appointments of the day in page 4-10.



Fig. 4-1 Tier-1 Employee Dashboard



Fig 4-2 Approve/Decline Transaction Page

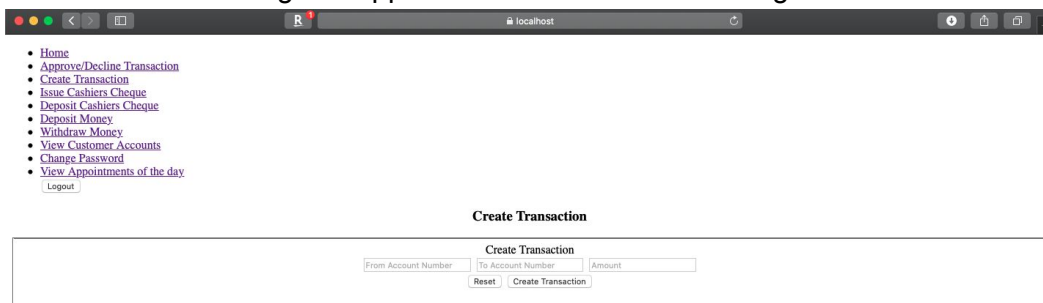


Fig 4-3 Create Transaction Page

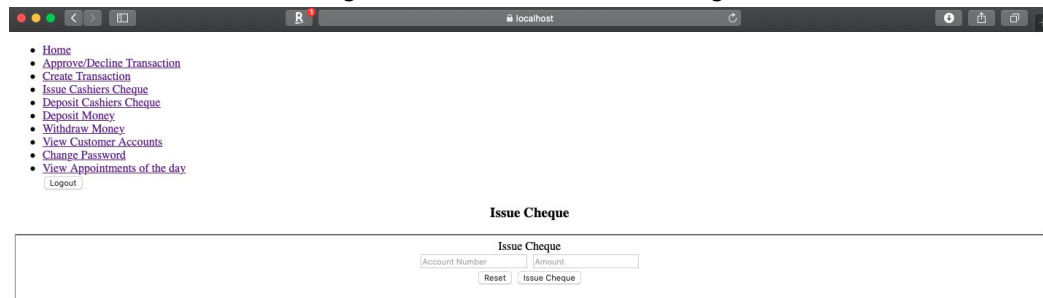
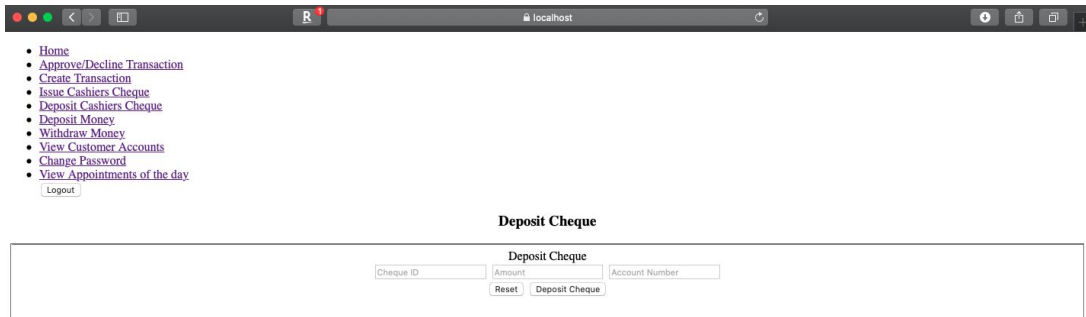
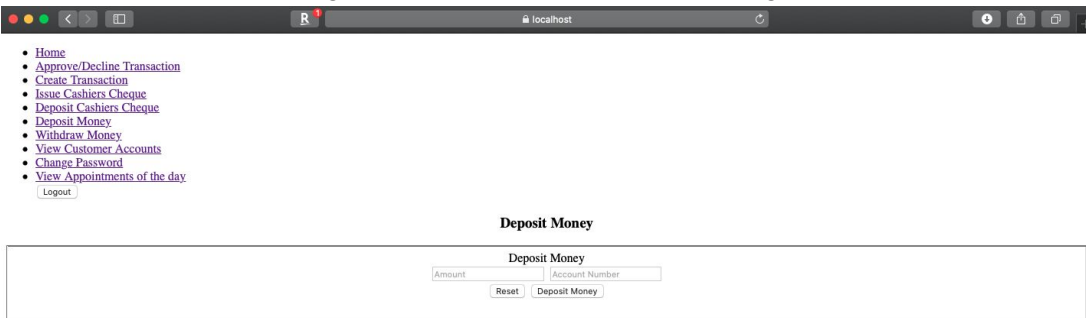


Fig 4-4 Issue Cashier Cheque Page



A screenshot of a web browser displaying the 'Deposit Cashier Cheque' page. The browser's address bar shows 'localhost'. On the left, a navigation menu lists various options: Home, Approve/Decline Transaction, Create Transaction, Issue Cashiers Cheque, Deposit Cashiers Cheque, Deposit Money, Withdraw Money, View Customer Accounts, Change Password, View Appointments of the day, and Logout. The main content area is titled 'Deposit Cheque' and contains a form with three input fields: 'Cheque ID', 'Amount', and 'Account Number'. Below these fields are two buttons: 'Reset' and 'Deposit Cheque'.

Fig 4-5 Deposit Cashier Cheque Page



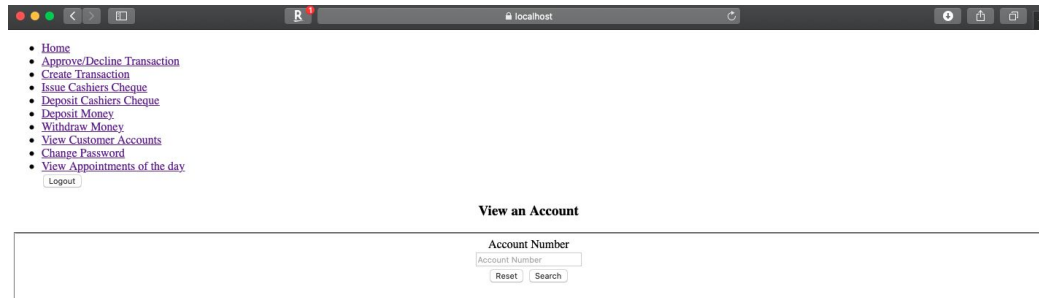
A screenshot of a web browser displaying the 'Deposit Money' page. The browser's address bar shows 'localhost'. The left navigation menu is identical to the previous page. The main content area is titled 'Deposit Money' and contains a form with two input fields: 'Amount' and 'Account Number'. Below these fields are two buttons: 'Reset' and 'Deposit Money'.

Fig 4-6 Deposit Money Page



A screenshot of a web browser displaying the 'Withdraw Money' page. The browser's address bar shows 'localhost'. The left navigation menu is identical to the previous pages. The main content area is titled 'Withdraw Money' and contains a form with two input fields: 'Amount' and 'Account Number'. Below these fields are two buttons: 'Reset' and 'Withdraw Money'.

Fig 4-7 Withdraw Money Page



A screenshot of a web browser displaying the 'View an Account' page. The browser's address bar shows 'localhost'. The left navigation menu is identical to the previous pages. The main content area is titled 'View an Account' and contains a form with one input field: 'Account Number'. Below this field are two buttons: 'Reset' and 'Search'.

Fig 4-8 View Customer Account Page

- [View Employee](#)
- [Create Employee](#)
- [Modify Employee](#)
- [Delete Employee](#)
- [System Logs](#)
- [Change Password](#)
- [Logout](#)

New Password

Old Password

New Password

New Password

Confirm Password

Confirm Password

Change Password

Fig 4-9 Change Password Page

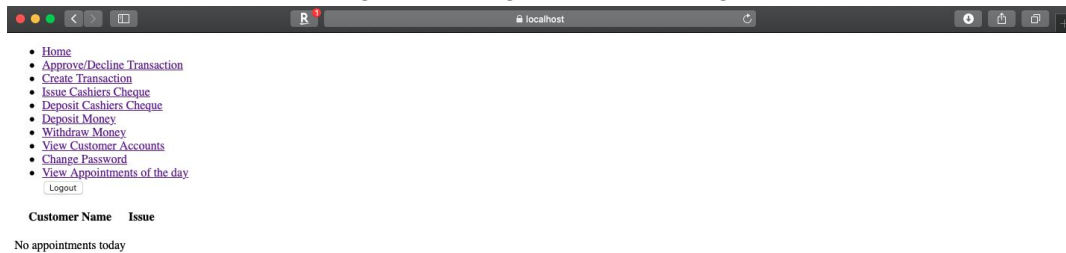


Fig 4-10 View Appointment of the Day Page

3.2.2 Tier-2 Employee

A Tier-2 Employee(Fig 5-1) can approve/decline critical transactions(>1000\$)(Fig 5-2). view(Fig 5-6),modify(Fig 5-7) and delete accounts(Fig 5-8) of the customers.A Tier-2 Employee also has the privileges approve and decline account creation requests (Fig 5-5).A Tier-2 Employee can also change his own password (Fig 5-3).The appointment schedules to the Tier-2 Employees for that day can be viewed(Fig 5-9).A Tier-2 Employee can also manage the locked accounts (Fig 5-4).

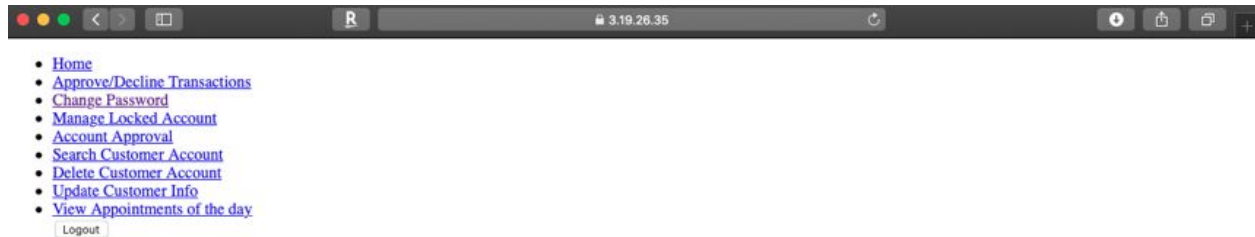


Fig 5-1 Tier-2 Employee Dashboard

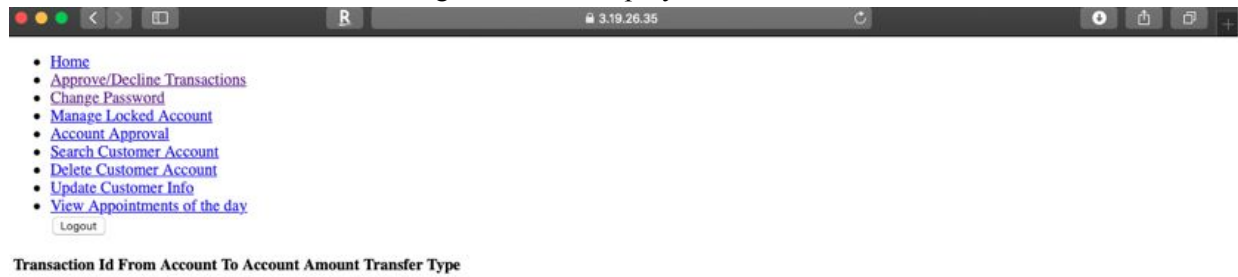


Fig 5-2 Approve/Decline Transactions Page

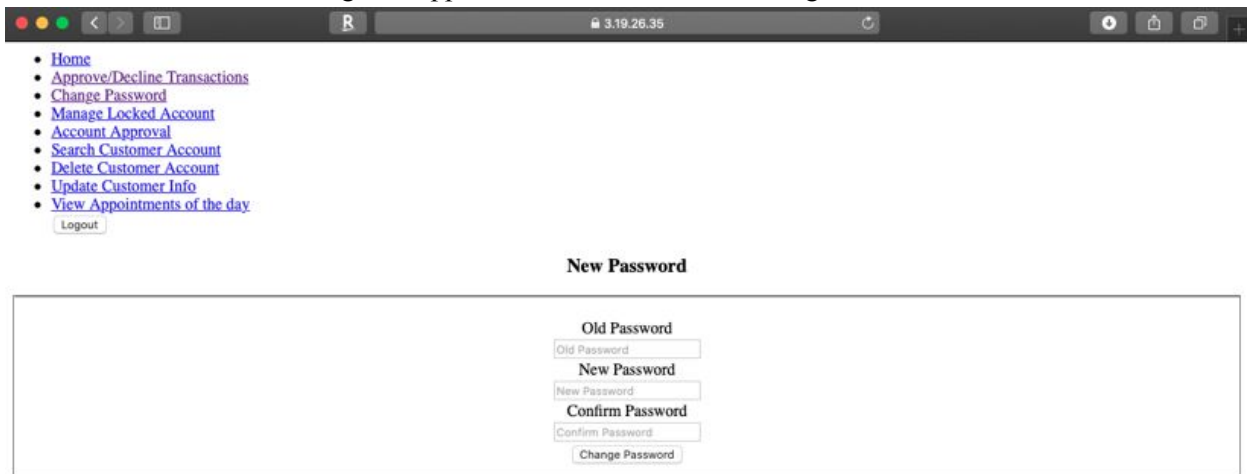


Fig 5-3 Change Password Page

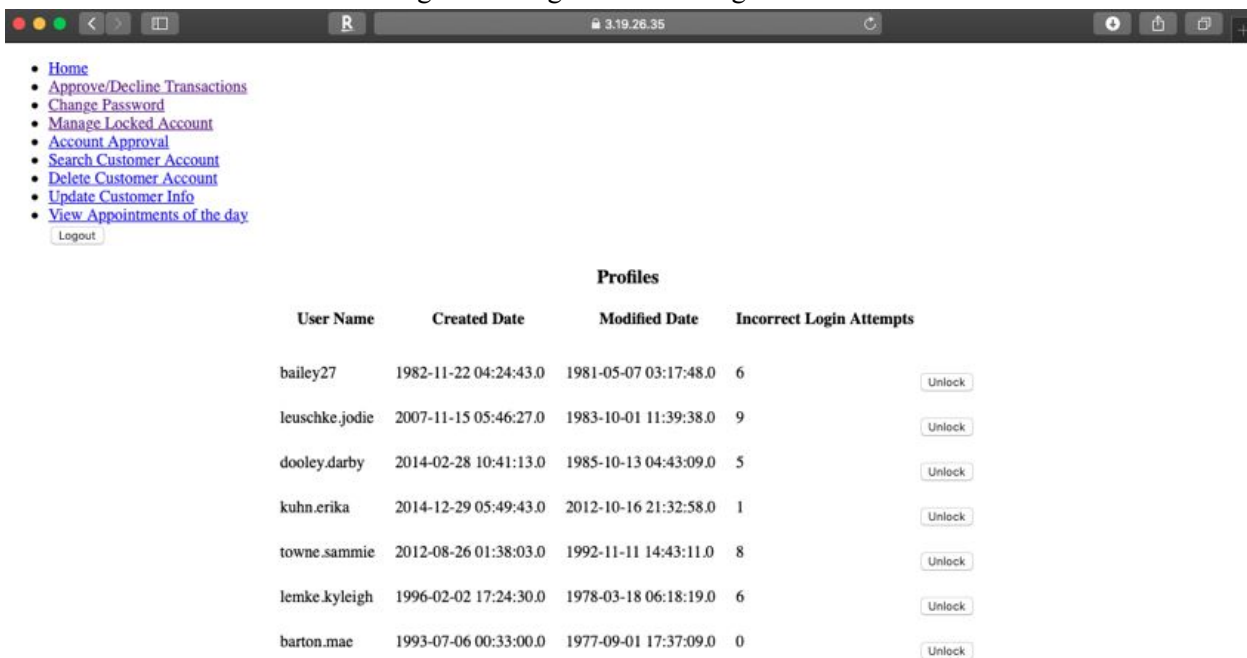


Fig 5-4 Manage Locked Account Page



Fig 5-5 Account Approval Page

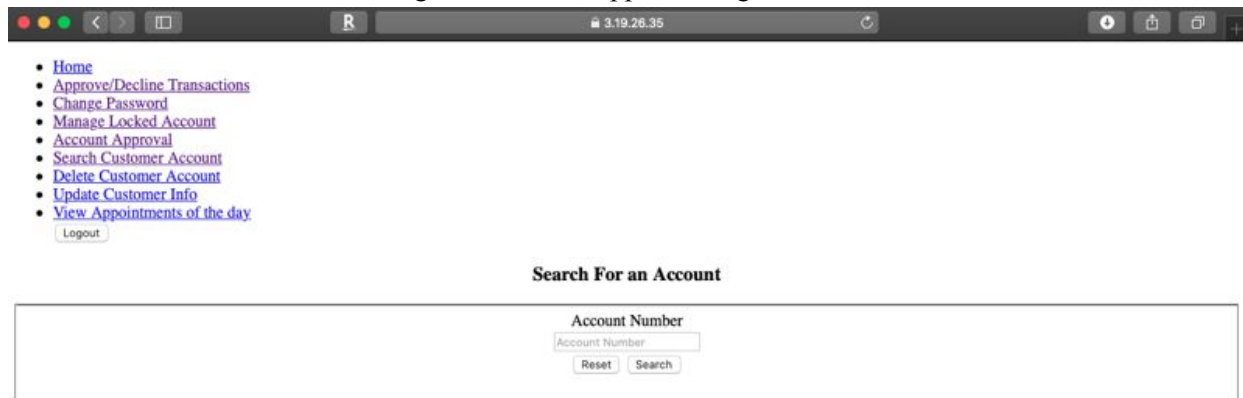


Fig 5-6 Search Customer Account Page

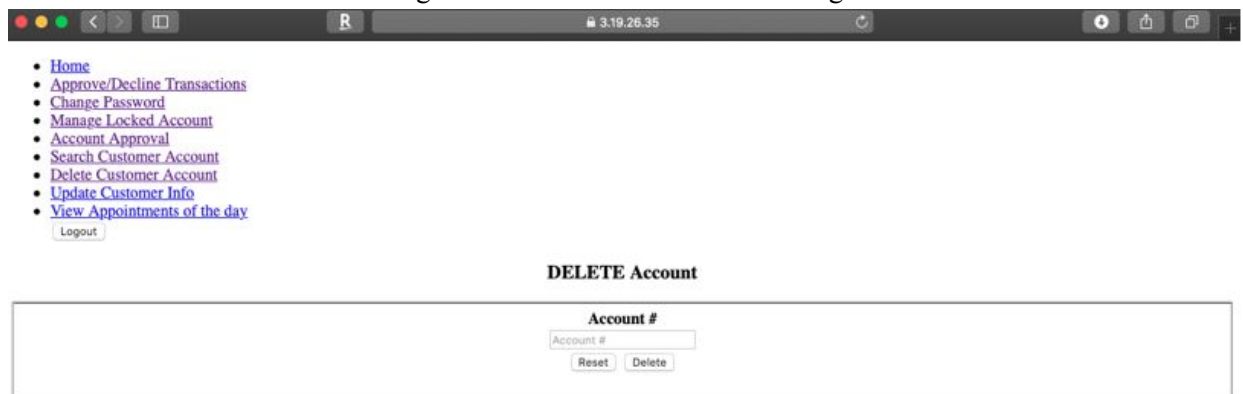


Fig 5-7 Delete Customer Account Page

Fig 5-8 Update Customer Info Page

Fig 5-9 View Appointment of the Day Page

3.2.3 Tier-3 Employee (Admin)

A Tier-3 Employee(Fig 6-1) can view(Fig 6-2), create(Fig 6-3),modify(Fig 6-4) and delete employees(Fig 6-5) from tier-1 and tier-2 .A Tier-3 Employee also has the privileges to view the System logs (Fig 6-6) in case of any internal issues.A Tier 3 Employee can also change his own password (Fig 6-7).

- [View Employee](#)
 - [Create Employee](#)
 - [Modify Employee](#)
 - [Delete Employee](#)
 - [System Logs](#)
 - [Change Password](#)
- [Logout](#)

Admin Dashboard

Fig 6-1 Tier-3 Admin Dashboard

Search For a User

User Name

User Name

Reset

Search

Personal Details

Username: yrunolfsson
First Name: Brandon
Middle Name: ullam
Last Name: Considine
Email: pouros.loyal@example.org
Phone: 749-450-6367

Fig 6-2 Tier-3 Admin View Employees

Registration

Date of birth must of the format MM/DD/YYYY and must be in the past User already exists in the database

Employee Type

Tier 1

Desired UserName

yrunolfssons

Email

test@g.com

Desired Password

Confirm Password

First Name

Test

Middle Name

Test

Last Name

Test

Address1

Test

Address2

Test

Phone Number

4807658849

DOB

12/02/2019

SSN

123456786

City

Test

Province

Test

Zip Code

85281

What primary school did you attend?

Test

In what town or city did your mother and father meet?

Test

Reset

Register

Fig 6-3 Tier-3 Admin Create Employees

- [View Employee](#)
 - [Create Employee](#)
 - [Modify Employee](#)
 - [Delete Employee](#)
 - [System Logs](#)
 - [Change Password](#)
- [Logout](#)

Employee Update

User Name
 

The Info username was updated

Employee Username
yrunolfsson
Email
pouros.loyal@example.org
First Name
Brandonhdsgm
Middle Name
ullam
Last Name
Considine
Phone Number
749-450-6367
<input type="button" value="Reset"/> <input type="button" value="Submit"/>

Fig 6-4 Tier-3 Admin Update Employee

- [View Employee](#)
 - [Create Employee](#)
 - [Modify Employee](#)
 - [Delete Employee](#)
 - [System Logs](#)
 - [Change Password](#)
- [Logout](#)

To delete an employee please provide the following information.

First Name:

Last Name:

User Name:

Fig 6-5 Tier 3 Admin Delete Employee

- [View Employee](#)
 - [Create Employee](#)
 - [Modify Employee](#)
 - [Delete Employee](#)
 - [System Logs](#)
 - [Change Password](#)
- [Logout](#)

System Logs

```

2020-04-02 00:00:04.133 INFO org.springframework.integration.endpoint.EventDrivenConsumer [SpringContextShutdownHook] Removing {logging-channel-adapter: org.springframework.integration.errorLogger} as a
subscriber to the 'errorChannel' channel
2020-04-02 00:00:04.135 INFO org.springframework.integration.channel.PublishSubscribeChannel [SpringContextShutdownHook] Channel 'application.errorChannel' has 0 subscriber(s).
2020-04-02 00:00:04.135 INFO org.springframework.integration.endpoint.EventDrivenConsumer [SpringContextShutdownHook] stopped bean 'org.springframework.integration.errorLogger'
2020-04-02 00:00:04.135 INFO org.springframework.scheduling.concurrent.ThreadPoolTaskScheduler [SpringContextShutdownHook] Shutting down ExecutorService 'taskScheduler'
2020-04-02 00:00:04.137 INFO org.springframework.scheduling.concurrent.ThreadPoolTaskExecutor [SpringContextShutdownHook] Shutting down ExecutorService 'applicationTaskExecutor'
2020-04-02 00:00:11.511 INFO bankApp.application.Application [main] Starting Application on Sriprashanth's-MacBook-Pro.local with PID 26308 (started by prashanth in /Users/prashanth/Documents/2nd
Sem/SS/CSE545-SS)
2020-04-02 00:00:11.512 INFO bankApp.application.Application [main] No active profile set, falling back to default profiles: default
2020-04-02 00:00:12.065 INFO org.springframework.integration.config.DefaultConfiguringBeanFactoryPostProcessor [main] No bean named 'errorChannel' has been explicitly defined. Therefore, a default
PublishSubscribeChannel will be created.
2020-04-02 00:00:12.071 INFO org.springframework.integration.config.DefaultConfiguringBeanFactoryPostProcessor [main] No bean named 'taskScheduler' has been explicitly defined. Therefore, a default
ThreadPoolTaskScheduler will be created.
2020-04-02 00:00:12.073 INFO org.springframework.integration.config.DefaultConfiguringBeanFactoryPostProcessor [main] No bean named 'integrationHeaderChannelRegistry' has been explicitly defined. Therefore, a
default DefaultHeaderChannelRegistry will be created.
2020-04-02 00:00:12.108 INFO org.springframework.context.support.PostProcessorRegistrationDelegate$BeanPostProcessorChecker [main] Bean
'org.springframework.integration.config.IntegrationManagementConfiguration' of type [org.springframework.integration.config.IntegrationManagementConfiguration] is not eligible for getting processed by all
BeanPostProcessors (for example: not eligible for auto-proxying)
2020-04-02 00:00:12.112 INFO org.springframework.context.support.PostProcessorRegistrationDelegate$BeanPostProcessorChecker [main] Bean 'integrationChannelResolver' of type
[org.springframework.integration.support.channel.BeanFactoryChannelResolver] is not eligible for getting processed by all BeanPostProcessors (for example: not eligible for auto-proxying)
2020-04-02 00:00:12.113 INFO org.springframework.context.support.PostProcessorRegistrationDelegate$BeanPostProcessorChecker [main] Bean 'integrationDisposableAutoCreatedBeans' of type
[org.springframework.integration.config.annotation.Disposables] is not eligible for getting processed by all BeanPostProcessors (for example: not eligible for auto-proxying)
2020-04-02 00:00:12.273 INFO org.springframework.boot.web.embedded.tomcat.TomcatWebServer [main] Tomcat initialized with port(s): 8443 (https)
2020-04-02 00:00:12.279 INFO org.apache.coyote.http11.Http11NioProtocol [main] Initializing ProtocolHandler ["https-jse-nio-8443"]
2020-04-02 00:00:12.280 INFO org.apache.catalina.core.StandardEngine [main] Starting service [Tomcat]
2020-04-02 00:00:12.280 INFO org.apache.catalina.core.StandardEngine [main] Starting Servlet engine: [Apache Tomcat/9.0.31]
2020-04-02 00:00:12.439 INFO org.apache.jasper.servlet.TldScanner [main] At least one JAR was scanned for TLDs yet contained no TLDs. Enable debug logging for this logger for a complete list of JARs that were
scanned but no TLDs were found in them. Skipping unneeded JARs during scanning can improve startup time and JSP compilation time.
2020-04-02 00:00:12.442 INFO org.apache.catalina.core.ContainerBase.[Tomcat].[localhost].[/] [main] Initializing Spring embedded WebApplicationContext
2020-04-02 00:00:12.443 INFO org.springframework.web.context.ContextLoader [main] Root WebApplicationContext: initialization completed in 908 ms
2020-04-02 00:00:12.733 INFO org.springframework.security.web.access.channel.ChannelProcessingFilter [main] Validated configuration attributes
2020-04-02 00:00:12.734 INFO org.springframework.security.web.DefaultSecurityFilterChain [main] Creating filter chain: any request,
[org.springframework.security.web.access.channel.ChannelProcessingFilter@7c5c20ed, org.springframework.security.web.context.request.async.WebAsyncManagerIntegrationFilter@45c423b3,
org.springframework.security.web.context.SecurityContextPersistenceFilter@63dc3420, org.springframework.security.web.header.HeaderWriterFilter@5bb97fe7,
org.springframework.security.web.csrf.CsrfFilter@7c226095, org.springframework.security.web.authentication.logout.LogoutFilter@1aed6f0b,
org.springframework.security.web.authentication.UsernamePasswordAuthenticationFilter@6a756b, org.springframework.security.web.savedrequest.HttpSessionSecurityFilter@547c6669]

```

Fig 6-6 Tier 3 Admin Sys Logs

- [View Employee](#)
 - [Create Employee](#)
 - [Modify Employee](#)
 - [Delete Employee](#)
 - [System Logs](#)
 - [Change Password](#)
- [Logout](#)

New Password

Old Password

Old Password

New Password

New Password

Confirm Password

Confirm Password

Change Password

Fig 6-7 Tier 3 Admin Update Password

3.3 External Users

3.3.1 Customer

Fig.7-1 shows the dashboard of the customer account. Customers can find the account information including savings account, checking account, and credit account. For each account, customers can deposit/withdraw money (Fig 7-1-1), view recent transactions (Fig 7-1-2), and transfer funds(Fig 7-1-3).

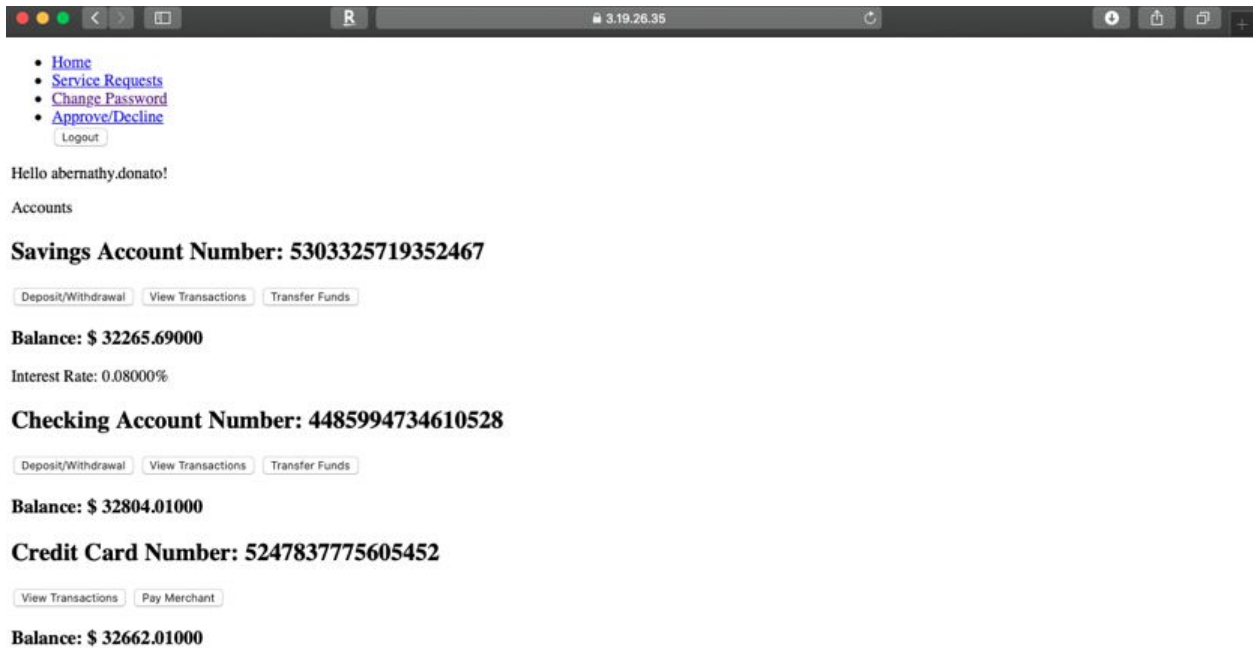


Fig 7-1 Customer Dashboard Page

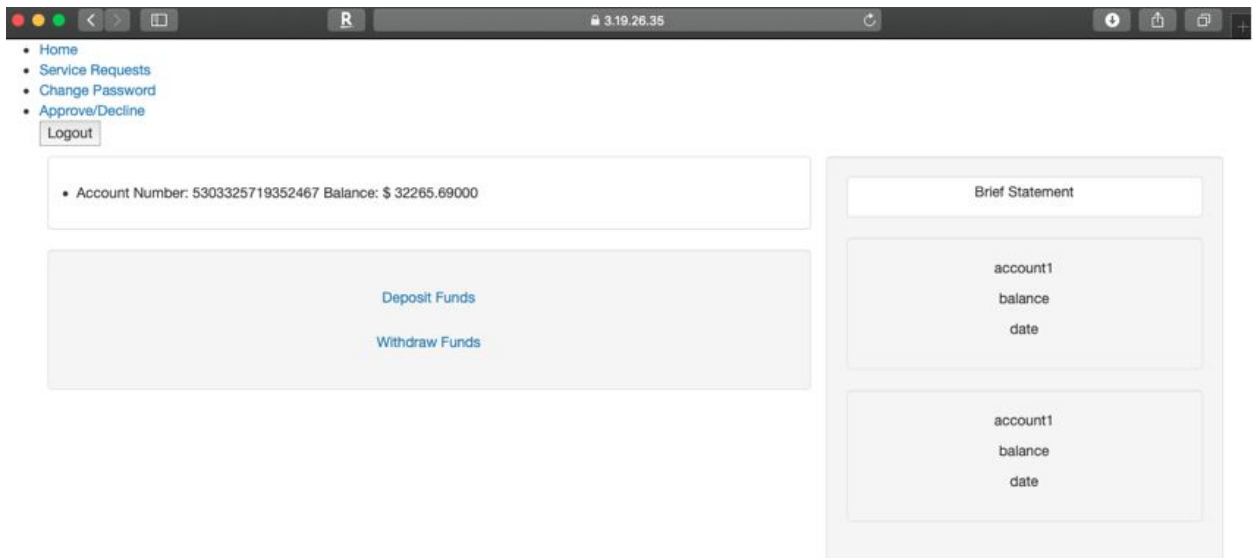


Fig 7-2 Deposit/ Withdraw Money Page

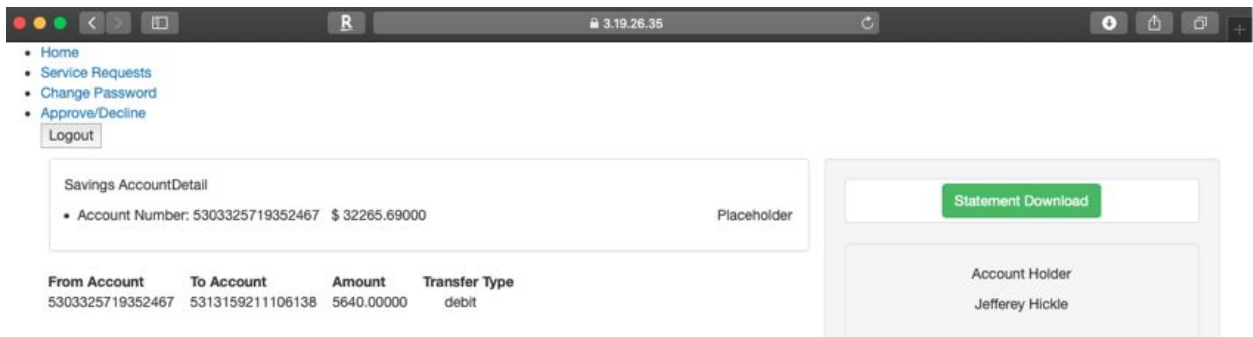


Fig 7-3 View Transactions Page

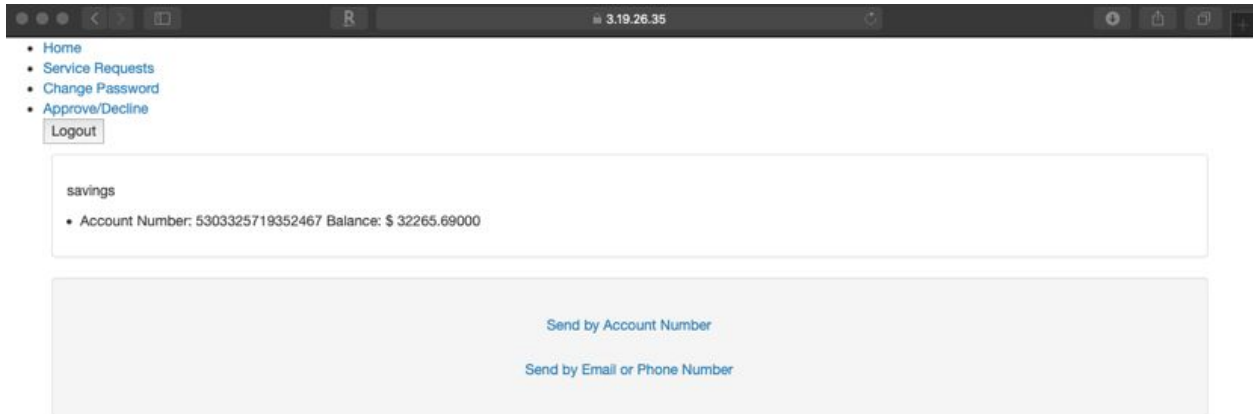


Fig 7-4 Transfer Funds Page

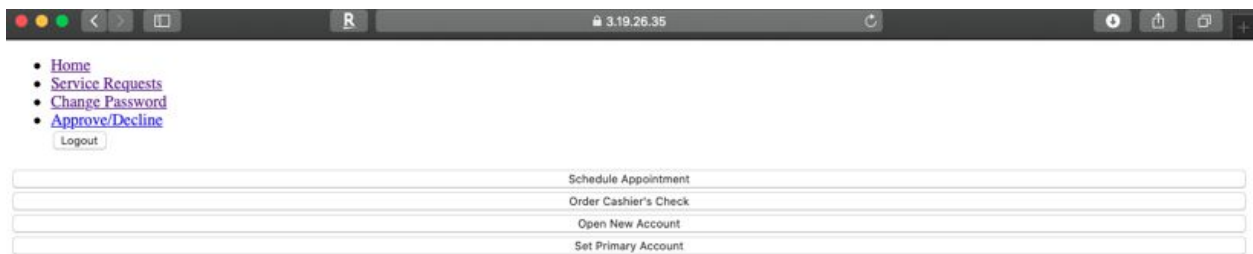


Fig 7-5 Service Request Page

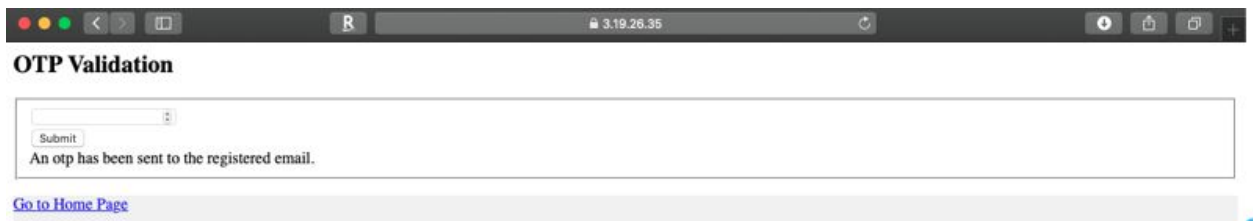


Fig 7-6 OTP Page for Scheduling an Appointment



Fig 7-7 Page for Scheduling an Appointment

Home
Service Requests
Change Password
Approve/Decline
Logout

Online Cashier's Check Portal

- Order Checks Deposit Check Online

Order Cashier's Check

Recipient's First Name

Recipient's Middle Name

Recipient's Last Name

Select Account

Amount

Order

Deposit Cashier's Check

Cashier's Check Number

Select Account to Deposit to

Deposit

Fig 7-8 Order/Deposit Cashier's Cheque Page

OTP Validation

Please wait for 5 minutes before requesting another OTP.

Submit

[Go to Home Page](#)

Fig 7-9 Opt Page for Opening a New Account

Open an Account

Type of Account

Reset Submit

Fig 7-10 Open New Account Page

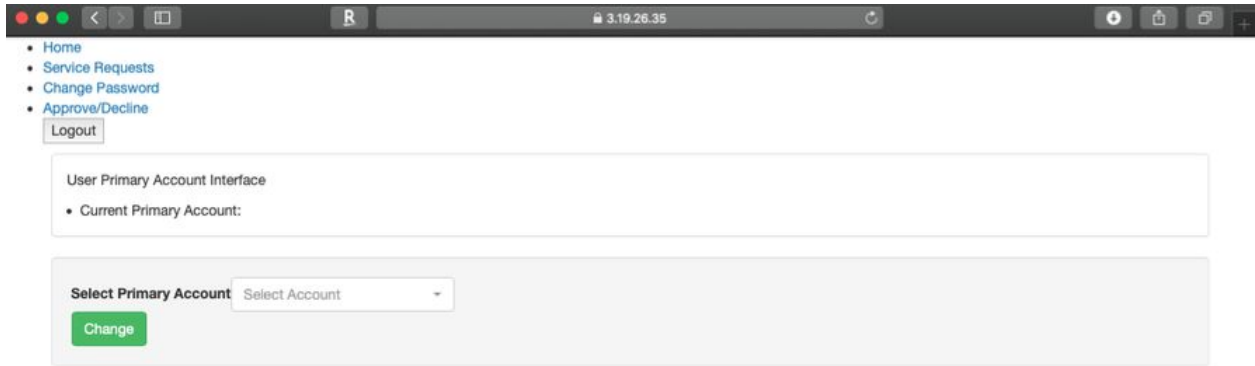


Fig 7-11 Set Primary Account Page



Fig 7-12 Change Password Page



Fig 7-13 Approve/Decline Page

4 Sample Users

Using the SystemTo get started, the database has been preloaded with sample Tier 1, Tier 2 and Admin employees. These profiles can be used for the purpose of testing our banking system.

Sample Customers

Username	Password
becker.westley	1234
murazik.dominique	1234
francisca.robelt	1234
weissnat.evan	1234
lera.runolfsdottir	1234

Sample Tier 1 Employees

Username	Password
grimes.sister	1234
herzog.sophia	1234
katheryn.runte	1234
steuber.hassie	1234
donnell.dietrich	1234

Sample Tier 2 Employees

Username	Password
mreynolds	1234
esteban10	1234
nhalvorson	1234
karelle.fritsch	1234
cole.meaghan	1234

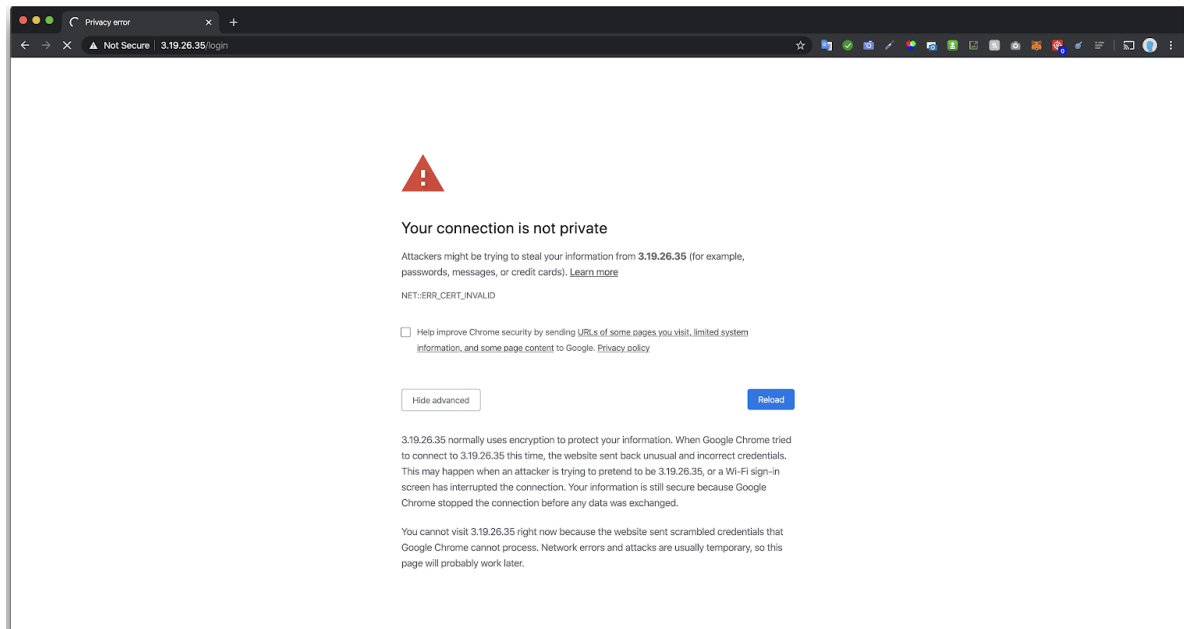
Sample Admin

Username	Password
schuster.jalyn	1234
tillman.matilde	1234
kailey.gibson	1234
davis.lorenz	1234
uheathcote	1234

Note# All the above profiles have 1234 as their passwords, for the sake of testing. More customer and employee profiles can be created. **The new customer profiles you create have to be approved by a Tier 2 employee before you can start using them.** Same goes for the employee profiles, except that these will be created by the admin.

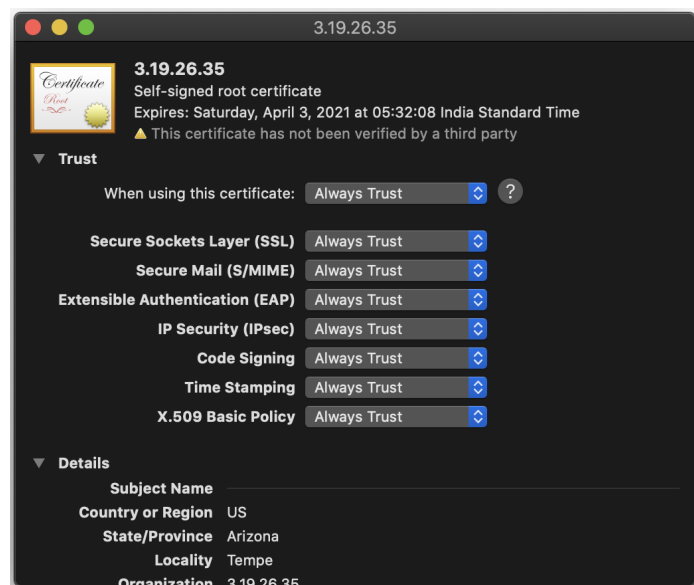
A new customer doesn't have any bank account linked by default. You must request for a bank account number by placing a request for an additional bank account. The same must then be approved by a Tier 2 employee. (Hint: New accounts show up on the bottom- in the Account Approval tab)

5 Possible Errors Troubleshooting



If you are greeted with a page, as shown above. You need to install the certificate. To do that, follow these steps:

1. Click on Non-Secure.
2. Download the certificate file.
3. If you're on Windows, open the certificate file and click install.
4. If you're on Mac, import the certificate in the Keychain and make sure 'Always Trust' is selected.



You should now be able to access the site with no issues.

