

# COMP201 Assignment 1

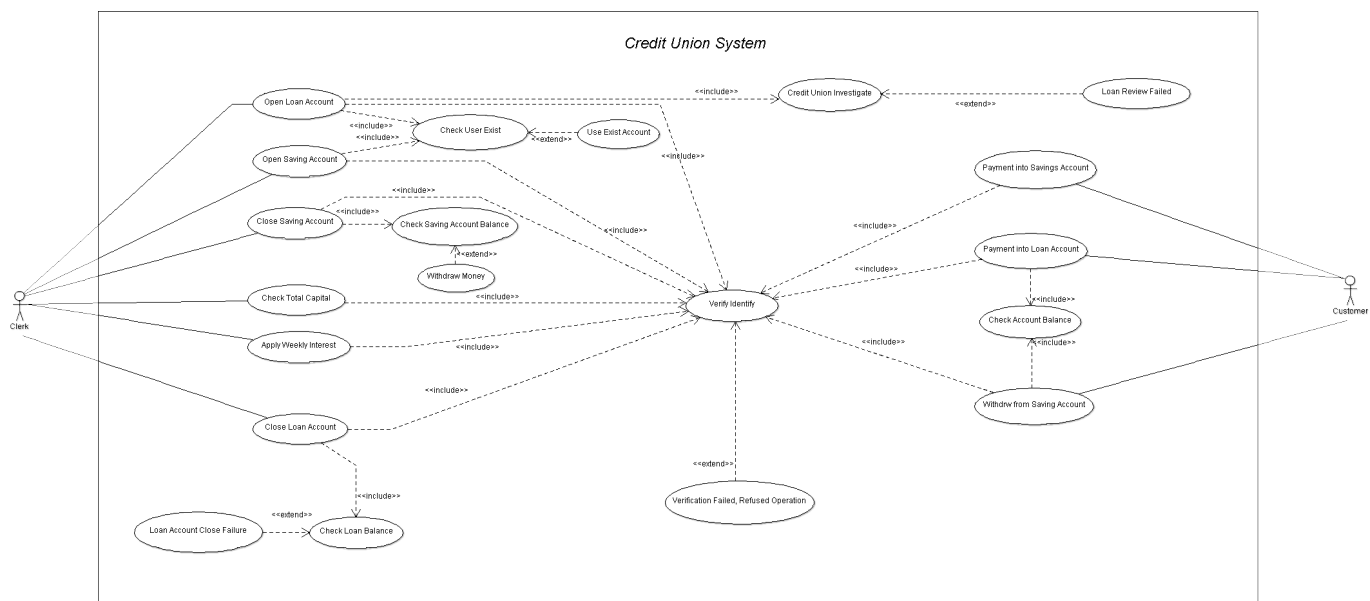
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Task 1: UML Use-Case Diagrams and Use-Case descriptions

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## Use Case Description

ID	UC_1_1
Name	Open Loan Account
Description	Bank clerk helps customer to open a loan account
Pre-condition	Clerk is available and credit union is working
Event Flow	<ol style="list-style-type: none"> <li>1. Include Use case check user exist.</li> <li>2. Include Use case Verify Identify</li> <li>3. Include Use case Credit Union Investigate</li> <li>4. If user already exist, then use the exist account, else create a new account (However, the prototype only allows one account per customer)</li> <li>5. If credit union allows to open an account, then the clerk give an account to the customer.</li> <li>6. Customer will receive the cash if he/she is open loan account successfully.</li> </ol>
Post-condition	Loan Account Balance Updated
Includes	<ol style="list-style-type: none"> <li>1. Include Use case check user exist.</li> <li>2. Include Use case Verify Identify</li> <li>3. Include Use case Credit Union Investigate</li> </ol>
Extensions	<ol style="list-style-type: none"> <li>1. Use case of Loan review Failed</li> <li>2. Use case of Use Exist Account</li> <li>3. Use case of Verification failed if clerk is not verified</li> </ol>
Triggers	Customer come to the credit union and ask for opening a loan account

ID	UC_1_2
Name	Open Saving Account
Description	Bank clerk helps customer to open a saving account

Pre-condition	Clerk is available and credit union is working
Event Flow	<ol style="list-style-type: none"> <li>1. Include Use case check user exist.</li> <li>2. Include Use case Verify Identify</li> <li>3. If user already exist, then use the exist account, else create a new account (However, the prototype only allows one account per customer)</li> <li>4. Customer will give the cash to the credit union</li> <li>5. Clerk will help customer to open a saving account with balance</li> </ol>
Post-condition	Loan Account Balance Updated
Includes	<ol style="list-style-type: none"> <li>1. Include Use case check user exist.</li> <li>2. Include Use case Verify Identify</li> </ol>
Extensions	<ol style="list-style-type: none"> <li>1. Use case of Use Exist Account</li> <li>2. Use case of Verification failed if clerk is not verified</li> </ol>
Triggers	Customer come to the credit union and ask for opening a saving account

ID	UC_1_3
Name	Close Saving Account
Description	Bank clerk helps customer to close a saving account
Pre-condition	<ol style="list-style-type: none"> <li>1. Clerk is available and credit union is working</li> <li>2. Customer exist an account and it is saving account</li> </ol>
Event Flow	<ol style="list-style-type: none"> <li>1. Include Use case Verify Identify</li> <li>2. If user's account with 0 balance, then close account directly.</li> <li>3. Else return all the balance to the customer and close account</li> </ol>
Post-condition	Saving Account Balance Updated and the account is deleted
Includes	<ol style="list-style-type: none"> <li>1. Include Use case Check saving account balance</li> <li>2. Include Use case Verify Identify</li> </ol>
Extensions	<ol style="list-style-type: none"> <li>1. Use case of Verification failed if clerk is not verified</li> <li>2. Use case of Verification failed if customer is not verified</li> <li>3. Use case of Check saving account balance = 0 then no need to withdraw money</li> </ol>

	4. Use case of Check saving account balance $\geq 0$ then it needs to withdraw money
Triggers	Customer come to the credit union and ask for closing a saving account

ID	UC_1_4
Name	Check Total Capital
Description	Clerk check the total capital of the credit union
Pre-condition	Clerk is available and credit union is working
Event Flow	<ol style="list-style-type: none"> <li>1. Include Use case of verify identify</li> <li>2. Clerk check the total capital and get the return</li> </ol>
Post-condition	Clerk get the Total Capital
Includes	Include Use case Verify Identify
Extensions	Use case of Verification failed if clerk is not verified
Triggers	Clerk check the total capital of the credit union

ID	UC_1_5
Name	Apply Weekly Interest
Description	Clerk apply weekly interest of 0.01% in each loan account
Pre-condition	<ol style="list-style-type: none"> <li>1. Clerk is available and credit union is working</li> <li>2. Exist at least one loan account to operate</li> </ol>
Event Flow	<ol style="list-style-type: none"> <li>1. Include Use case of verify identify</li> <li>2. Clerk apply weekly interest for each loan accounts</li> </ol>
Post-condition	Each loan account will apply 0.01% interest
Includes	Include Use case Verify Identify
Extensions	Use case of Verification failed if clerk is not verified
Triggers	Clerk Apply Weekly Interest

ID	UC_1_6
Name	Close Loan Account
Description	Bank clerk helps customer to close a Loan account
Pre-condition	<ol style="list-style-type: none"> <li>1. Clerk is available and credit union is working</li> <li>2. Customer exist an account and it is Loan account</li> </ol>
Event Flow	<ol style="list-style-type: none"> <li>1. Include Use case Verify Identify</li> <li>2. Include Use case Check loan balance</li> <li>3. If user's account with 0 balance, then close account directly.</li> <li>4. Else Refuse the request</li> </ol>
Post-condition	Saving Account Balance Updated and the account is deleted
Includes	<ol style="list-style-type: none"> <li>1. Include Use case Check loan balance</li> <li>2. Include Use case Verify Identify</li> </ol>
Extensions	<ol style="list-style-type: none"> <li>1. Use case of Verification failed if clerk is not verified</li> <li>2. Use case of Verification failed if customer is not verified</li> <li>3. Use case of Check saving account balance &lt; 0 then refuse request (Account Close Failure)</li> </ol>
Triggers	Customer come to the credit union and ask for closing a Loan account

ID	UC_1_1_1
Name	Credit Union Investigate
Description	Credit Union check the loan apply which is beyond the total capital*5% or more than 5000
Pre-condition	Credit union is working
Event Flow	<ol style="list-style-type: none"> <li>1. If user's request with the smaller than total capital*5% and smaller than 5000</li> <li>2. Else Refuse the request</li> </ol>
Post-condition	Credit Union agree to loan
Includes	-----
Extensions	Use case of loan review failed
Triggers	Customer come to the credit union and ask for opening a loan account, and clerk ask credit union to check the request

ID	UC_1_1_1_1
Name	Loan Review Failed
Description	Credit Union refuse to open a loan account for customer
Pre-condition	Credit union is working
Event Flow	<ol style="list-style-type: none"> <li>1. If user's request with the higher than total capital*5% or higher than 5000 then refuse</li> </ol>
Post-condition	Credit Union Refuse to loan
Includes	-----
Extensions	-----
Triggers	Customer come to the credit union and ask for opening a loan account, and user's request with the bigger than total capital*5% or bigger than 5000

ID	UC_1_1_2
Name	Check User Exist
Description	Clerk checks the customer is exist
Pre-condition	Clerk is available and credit union is working
Event Flow	<ol style="list-style-type: none"> <li>1. If customer exist an account, then use exist account (It is impossible in this prototype)</li> <li>2. Else create a new account</li> </ol>
Post-condition	-----
Includes	-----
Extensions	Use Exist Account

Triggers	Customer come to the credit union and ask for opening a loan or saving account
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ID	UC_1_1_2_1
Name	Use Exist Account
Description	1. the customer is existing (It is impossible in this prototype)
Pre-condition	Clerk is available and credit union is working
Event Flow	<ol style="list-style-type: none"> <li>1. If customer exist an account, then use exist account (It is impossible in this prototype)</li> <li>2. Else create a new account</li> </ol>
Post-condition	Use exist account
Includes	-----
Extensions	-----
Triggers	Customer come to the credit union and ask for opening a loan or saving account

ID	UC_1_3_1
Name	Check Saving Account Balance
Description	Clerk check saving account balance when customer would like to close a saving account
Pre-condition	Clerk is available and credit union is working
Event Flow	<ol style="list-style-type: none"> <li>1. Clerk check the value of customer's saving account</li> <li>2. Clerk return the cash and close the account</li> </ol>
Post-condition	The balance shows for clerk
Includes	-----
Extensions	Extend use case of withdraw money
Triggers	Customer come to the credit union and ask for close saving account

ID	UC_1_3_1_1
Name	Withdraw money
Description	Clerk return the cash if the customer's account has balance



Pre-condition	<ol style="list-style-type: none"> <li>1. Clerk is available and credit union is working</li> <li>2. Customer has balance when account is closing</li> </ol>
Event Flow	Clerk return the cash and close the account
Post-condition	Customer get the cash and the saving account is closed
Includes	-----
Extensions	-----
Triggers	Customer come to the credit union and ask for close saving account when saving account has balance

ID	UC_1_6_1
Name	Check Loan Balance
Description	Clerk have to check the loan account balance before closing
Pre-condition	<ol style="list-style-type: none"> <li>1. Clerk is available and credit union is working</li> <li>2. Customer want to close loan account</li> </ol>
Event Flow	<p>If user's account with 0 balance, then close account directly.</p> <p>Else Refuse the request</p>
Post-condition	Customer closes the loan account
Includes	-----
Extensions	Loan Account Close Failure
Triggers	Customer come to the credit union and ask for close loan account

ID	UC_1_6_1_1
Name	Loan Account Close Failure
Description	Loan Account Close Failure, because the balance is not zero
Pre-condition	<ol style="list-style-type: none"> <li>1. Clerk is available and credit union is working</li> <li>2. Customer want to close loan account</li> </ol>
Event Flow	<p>If user's account with 0 balance, then close account directly.</p> <p>Else Refuse the request</p>
Post-condition	The request of customer is declined

Includes	-----
Extensions	-----
Triggers	Customer come to the credit union and ask for close loan account when account balance is not 0

ID	UC_2_1
Name	Payment into Saving Account
Description	Customer makes a payment of saving account
Pre-condition	1. Credit union is working 2. Customer has saving account
Event Flow	1. Include use case verify identify 2. Make a payment to the saving account
Post-condition	The account was topped up
Includes	verify identify
Extensions	-----
Triggers	Customer makes a payment of saving account

ID	UC_2_2
Name	Payment into Loan Account
Description	Customer makes a payment of loan account
Pre-condition	1. Credit union is working 2. Customer has loan account with negative balance
Event Flow	1. Include use case verify identify 2. Make a payment to the loan account if the top up money is smaller than balance of absolute value
Post-condition	The loan account was topped up
Includes	1. verify identify 2. check account balance
Extensions	-----
Triggers	Customer makes a payment of loan account

ID	UC_2_2_1
Name	Check Account Balance
Description	The system checks the customer's account balance when customer is making a payment of loan or withdraw from saving account
Pre-condition	1. Credit union is working
Event Flow	Make a payment to the loan account or with draw the money from saving account
Post-condition	The balance has been checked
Includes	-----
Extensions	-----
Triggers	Customer makes a payment of loan account or withdraw from saving account

ID	UC_2_3
Name	Withdraw from saving account
Description	Customer withdraw from saving account
Pre-condition	1. Credit union is working 2. Customer has saving account with higher than 0 balance
Event Flow	1. Include use case verify identify 2. Include use case check account balance 3. Make a withdraw to the saving account if the withdrawals are smaller than deposits
Post-condition	The saving account was withdraw
Includes	1. verify identify 2. check account balance
Extensions	-----
Triggers	Customer makes a withdraw of saving account

ID	UC_3
Name	Verify identify
Description	Verify clerk identify when clerk is opening an account and closing and apply interest. Or checking the customer identify when customer is making a payment or withdraw

Pre-condition	1. Clerk or Customer operation 2. Credit union is working
Event Flow	1. If clerk is opening an account and closing and apply interest, the id needs to be verified, else if customer is making a payment or withdraw to an account 2. The id is checked
Post-condition	Id checked
Includes	-----
Extensions	Verify Failed, refused operation
Triggers	Clerk or Customer operation

ID	UC_3_1
Name	Verify Failed, refused operation
Description	The operation has been declined
Pre-condition	Illegal clerk or customer
Event Flow	Operation has been declined
Post-condition	Operation has been declined
Includes	-----
Extensions	-----
Triggers	Illegal clerk or customer

## Task 2: 5 Functional requirements

1. Clerk can close a saving account;
2. Clerk can open a saving account on behalf of customer;
3. Customer can withdraw money from their saving account;
4. Customer can pay money into their savings account;
5. Clerk can apply a weekly interest rate of 0.01% on all outstanding loan balances in the credit union.

## Task 3: 5 Non-Functional requirements

1. The coding language should use Java

Verifiable:

The program can run through the JAVA IDE

2. Programs should use object-oriented programming

Verifiable:

The program can run through the JAVA IDE and it should use object-oriented programming and have classes and instance objects of that class

3. The program should run on a signal laptop computer

Verifiable:

Run the completed program on a signal laptop computer and through a lot of repeated tests, verify that the program is working properly.

4. The database should be fully encrypted and encrypted using modern banking standards.

Verifiable:

Verify whether the database conforms to the above bank information encryption standards and conduct a lot of attack tests to ensure the security of the database.\

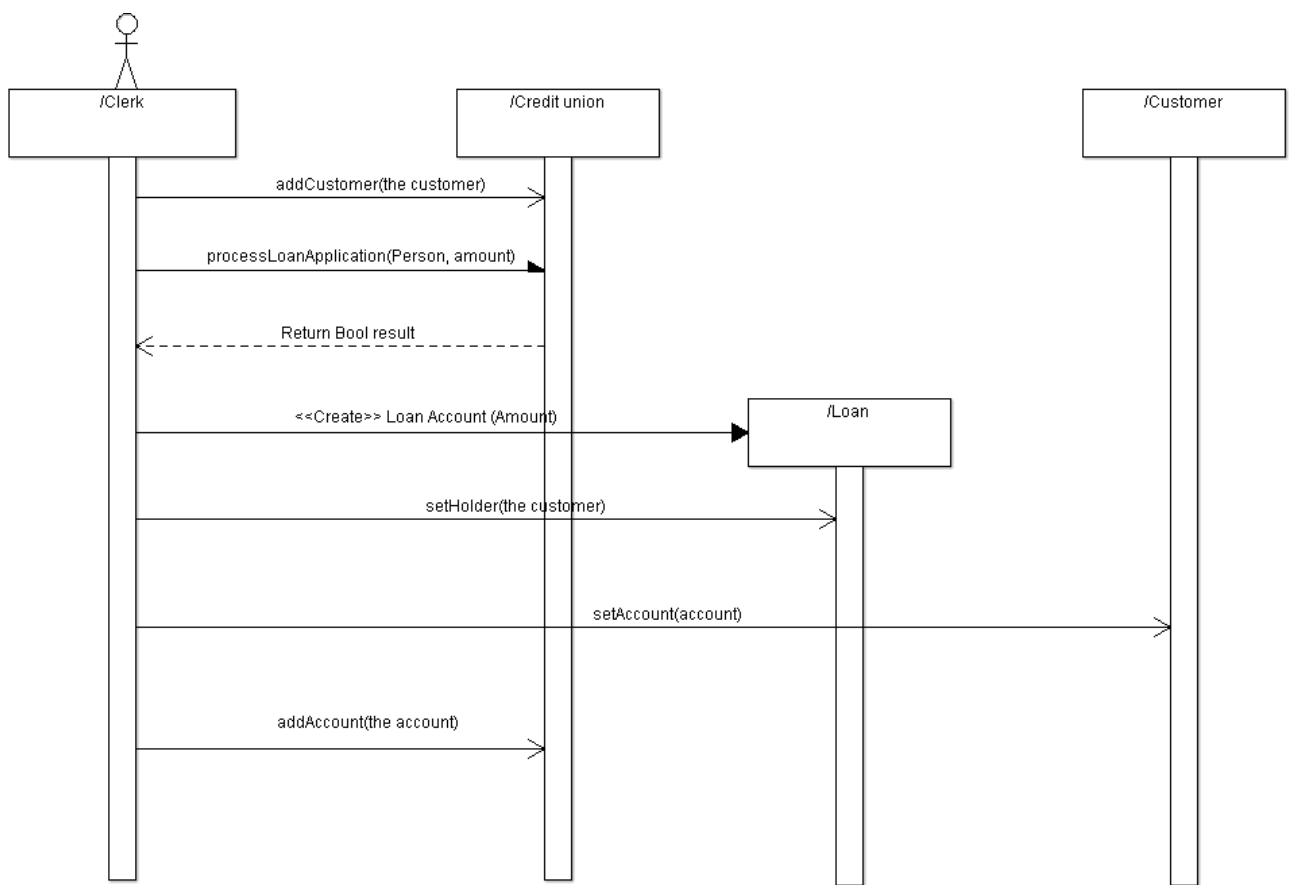
5. The system shall not disclose any personal information other than customer name and the necessary information to the system operator.

Verifiable:

Verify that the client's private information is set to private in the class and whether all unnecessary arguments passed to external functions are set to private. Finally, the graph of the function is drawn to calculate whether the user privacy information is exposed to the external irrelevant function.

## Task 5: UML Sequence Diagram

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*The Sequence Diagram based on the Java Code, however, some parts have no return in the clerk action, so it some method like 'setHolder' has no return.*