COMP201 - Assignment 1
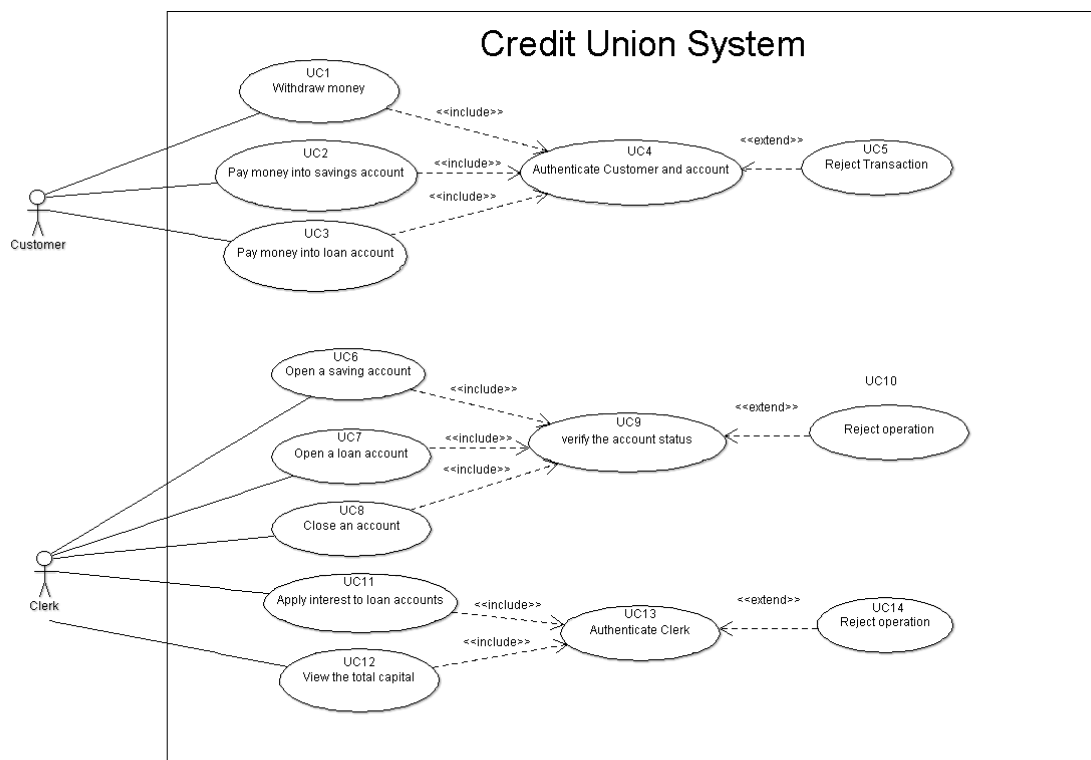
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Task 1

Use case Diagram:

Use case description:

ID	UC1
Name	Withdraw money
Description	Credit Union customer withdraw money
Pre-condition	Credit Union system in service
	Credit Union has sufficient cash in stock
Event flow	1. Include Use case 4 'Authenticate customer'
	2. Check balance
	3. Choose receipt option
	4. Take cash
Extension points	
Triggers	Withdraw cash service requested
Post-condition	Balance updated
	Cash dispensed
	Total capital in Credit Union decreased

ID	UC2
Name	Pay money into saving account
Description	Credit Union customer pays money into his/her saving account
Pre-condition	Credit Union system in service
Event flow	1. Include Use case 4 'Authenticate customer'
	2. Check balance
	3. Choose the mode of saving money
	4. Save money into the customer's saving account
Extension points	
Triggers	Saving cash service requested
Post-condition	Balance updated
	Total capital in Credit Union increased

ID	UC3
Name	Pay money into loan account
Description	Credit Union customer pays money into his/her loan account
Pre-condition	Credit Union system in service
Event flow	1. Include Use case 4 'Authenticate customer'
	2. Check balance
	3. Pay money into customer's loan account
Extension points	
Triggers	Paying loan service requested
Post-condition	Balance updated
	Total capital in Credit Union increased

ID	UC4
Name	Authenticate customer and account
Description	Credit Union customer proves his/ her identity
Pre-condition	Credit Union system in service
Event flow	1. If customer and account already authenticated, exit from use case

	2. Credit Union customer enters name
	3. Check the amount of money customer wants to pay or withdraw is valid
Extension points	Use case 5 "reject transaction"
Triggers	Authenticated service requested and customer not authenticated
Post-condition	Credit Union customer is authenticated if credentials correct

ID	UC5
Name	Reject transaction
Description	Credit Union rejects customers' transaction
Pre-condition	Credit Union customer is not authenticated
Event flow	1. Reject any operation of this customer
Extension points	
Triggers	Credit Union customer is not authenticated
Post-condition	This customer cannot pay or withdraw money

ID	UC6
Name	Open a saving account
Description	Credit Union clerk opens a saving account for the customer
Pre-condition	Credit Union system in service Credit Union clerk is free
Event flow	1. Include use case 9 "verify account status" 2. Credit Union clerk enters customer's name 3. Credit Union clerk takes customer's money 4. Credit Union clerk opens a new saving account for the customer and saves corresponding money the customer requested
Extension points	
Triggers	Open saving account service requested
Post-condition	Balance of this new saving account updated Total capital in Credit Union increased

ID	UC7
Name	Open a loan account
Description	Credit Union clerk opens a loan account for the customer
Pre-condition	Credit Union system in service Credit Union clerk is free
Event flow	1. Include use case 9 "verify account status" 2. Credit Union clerk enters customer's name 3. Credit Union clerk opens a new loan account for the customer and takes out corresponding money the customer requested 4. Credit Union clerk gives cash to the customer
Extension points	
Triggers	Open loan account service requested
Post-condition	Balance of this new saving account updated Total capital in Credit Union increased

ID	UC8
Name	Close an account

Description	Credit Union clerk close an account for the customer
Pre-condition	Credit Union system in service
	Credit Union clerk is free
Event flow	1. Include use case 9 "verify account status"
	2. Close the account that customer requested
Extension points	
Triggers	Close account service requested
Post-condition	Remove the information of this account out of the Credit Union system
	Total capital in Credit Union updated

ID	UC9
Name	verify the account status
Description	Credit Union clerk check the account status
Pre-condition	Credit Union system in service
	The clerk opens or closes an account
Event flow	If clerk opens an account
	1. Check the amount of money customer wants to loan is valid
	2. Check the amount of money customer wants to save is valid
	If clerk closes an account
	1. Check the balance of this account
Extension points	Use case 10 "reject operation"
Triggers	The clerk is ready to open or close an account
Post-condition	Opening or closing an account is allowed if the operation is valid

ID	UC10
Name	Reject operation
Description	Credit Union clerk rejects to open or close an account
Pre-condition	Credit Union system in service
	The account status after operation is invalid
Event flow	1. Open or close an account is rejected by the clerk
Extension points	
Triggers	The account status after operation is invalid
Post-condition	Operation denied

ID	UC11
Name	Apply interest to loan accounts
Description	Credit Union clerk applies interest to loan accounts weekly
Pre-condition	Credit Union system in service
Event flow	1. Include use case 13 "Authenticate clerk"
	2. Credit Union clerk applies interest
	3. Update all the loan balance in the Credit Union system
Extension points	
Triggers	Credit Union clerk is ready to apply interest to loan accounts
Post-condition	all the loan balance in the Credit Union system updated

ID	UC12
Name	View the total capital

Description	Credit Union clerk views the total capital of Credit Union
Pre-condition	Credit Union system in service
Event flow	1. Include use case 13 "Authenticate clerk" 2. Credit Union clerk views the total capital
Extension points	
Triggers	Credit Union clerk is ready to view the total capital of Credit Union
Post-condition	Credit Union clerk get the value of total capital

ID	UC13
Name	Authenticate Clerk
Description	Credit Union clerk proves his/ her identity
Pre-condition	Credit Union system in service
Event flow	1. If the clerk already authenticated, exit from uses case 2. Check whether this clerk works for Credit Union
Extension points	Use case 14 "reject transaction"
Triggers	Authenticated service requested and clerk not authenticated
Post-condition	Credit Union clerk is authenticated if credentials correct

ID	UC14
Name	Reject operation
Description	Credit Union rejects the operation
Pre-condition	Credit Union system in service
Event flow	Credit Union clerk is not authenticated
Extension points	Reject any operation of this clerk
Triggers	Credit Union clerk is not authenticated
Post-condition	This clerk cannot pay or withdraw money

Task 2

5 functional requirements

1. The system shall be able to update all the information of clerks, customers and customers' accounts.
2. The system shall be able to judge whether the clerk can open or close an account for the customer.
3. An authenticated customer shall be able to withdraw from and pay money into his/ her account.
4. An authenticated clerk shall be able to view the total capital and apply interest to all the loan account in the system weekly.
5. The system shall be able to deny the operation if the user is not authenticated.

Task 3

5 non-functional requirements

1. The System should have a maximum response time of 5 seconds when processing transactions.

To verify that the system can response within 5 seconds when processing transactions, a monitoring system can be attached to this product, which document all response times when transaction happens. This monitoring system is also able to alert software engineers when response time of the system is greater than the threshold.

2. The system is to comply with the regulations set out in GDPR.
   A legal domain consultant or expert will be hired to check whether the system meets all the expected standards.

3. The system should have a user-friendly interface.
   An investigation can be created for some system users, asking their opinion of the user interface. If the consensus is that it is user-friendly, then this requirement has been met. Otherwise, the interface should be improved to satisfy this requirement, such as using graphics and adding more instructions for the users.

4. The system should be portable and be able to run on a single laptop computer.
   To verify this requirement, we should check that the size of system itself is available for a laptop computer at first. Then, it should be also measured that how much memory will be occupied when the system is running. If both sub-requirements are met, the system can be verified as portable.

5. The system should be robust with a low probability of data corruption on failure.
   To verify this requirement, some extreme situation can be tested on the system such as sudden electricity failure and many simultaneous operations. If all the data can be kept safely, this requirement is verified.

Task 5

UML Sequence diagram:

Diagram participants: /Person: Customer, /Person: Clerk, /Credit Union, /loanAccount

- openloan(Customer, loanAmount)
- ContainThisCustomer(Customer)?
- add thisCustomer
- return true/ false
- processLoanApplication(theClerk, amount)
- return true/ false
- <<create>>(loanAccount)
- setBalance(amount)
- setHolder(Customer)
- create loan account succeddfully
- addAccount(Account)
- openLoanAccount successfully?