Use Cases based on Asset Securitization:

1. **Loan Origination and Pooling:**

In this assignment, the focus is on the initial steps of the securitization process: originating loans and pooling them together based on their similarities.

Tasks:

- Develop a loan origination system that collects and manages information about borrowers, loan amounts, interest rates, and other relevant details.
- Implement an algorithm to group loans into pools based on criteria such as loan type, maturity, credit rating, or other relevant factors.
- Ensure compliance with relevant regulations during the loan origination and pooling processes.
- Design a user interface for loan officers and other stakeholders to input and review loan data and pool information.

2. **Asset-backed Securities (ABS) Issuance and Tranching:**

This assignment focuses on the creation of asset-backed securities and the process of dividing the pooled assets into tranches with different risk-return profiles.

Tasks:

- Create a system to convert the pooled loans into asset-backed securities (ABS).
- Develop a method for dividing the pooled assets into tranches, considering factors such as credit risk, cash flow, and investor preferences.
- Incorporate credit enhancements, such as overcollateralization or third-party guarantees, to improve the credit quality of the securities.
- Coordinate with credit rating agencies to obtain ratings for the various tranches of the ABS.
- Ensure compliance with relevant regulations during the ABS issuance and tranching processes.

3. **Servicing, Payment Distribution, and Investor Relations:**

This assignment deals with the ongoing servicing of the loans and the distribution of payments to investors, as well as maintaining relationships with investors and other stakeholders.

Tasks:

- Implement a loan servicing system that collects principal and interest payments from borrowers, manages loan delinquencies, and handles other servicing-related tasks.
- Develop a system for distributing payments to investors according to the terms of the asset-backed securities, taking into account the different tranches and payment priorities.
- Monitor the performance of the underlying assets and provide regular updates to investors and other stakeholders.
- Establish a communication channel for investor relations, addressing questions, concerns, and providing information on the performance of the asset-backed securities.
- Ensure compliance with relevant regulations during the servicing, payment distribution, and investor relations processes.

R3 Corda Flows and Implementation Flows:

1. *Loan Origination and Pooling:*

   Corda Flows:

   - **CreateLoanFlow**: Creates a new loan state on the ledger.
   - **PoolLoansFlow**: Combines multiple loans into an asset pool state.

   Implementation Plan:

   a. Define the Loan state and the AssetPool state with relevant properties.
   b. Create the CreateLoanFlow to issue new loans on the ledger.
   c. Develop the PoolLoansFlow to combine multiple loans into an asset pool state.
   d. Implement the necessary contracts and tests for the loan origination and pooling processes.
   e. Create a user interface to interact with the loan origination and pooling flows.

2. *Asset-backed Securities (ABS) Issuance and Tranching:*

   Corda Flows:

   - **IssueABSFlow**: Issues asset-backed securities based on an asset pool.
   - **TrancheABSFlow**: Divides the asset-backed securities into tranches with different risk-return profiles.

   Implementation Plan:

   a. Define the ABS state and the Tranche state with relevant properties.
   b. Create the IssueABSFlow to issue asset-backed securities based on an asset pool.
   c. Develop the TrancheABSFlow to divide the asset-backed securities into tranches.
   d. Implement the necessary contracts and tests for the ABS issuance and tranching processes.
   e. Coordinate with credit rating agencies to integrate credit ratings into the tranching process.

3. *Servicing, Payment Distribution, and Investor Relations:*

Corda Flows:

- **CollectPaymentsFlow**: Collects payments from borrowers and updates the loan states.
- **DistributePaymentsFlow**: Distributes payments to investors according to the terms of the asset-backed securities.

Implementation Plan:

a. Create a Payment state to represent payments collected from borrowers.
b. Develop the CollectPaymentsFlow to collect payments and update the loan states accordingly.
c. Implement the DistributePaymentsFlow to distribute collected payments to investors based on the terms of the ABS and their respective tranches.
d. Implement the necessary contracts and tests for the servicing and payment distribution processes.
e. Establish a communication channel for investor relations to provide updates on the performance of the asset-backed securities.

Properties required for each flow:

1. *Loan Origination and Pooling:*

   a. CreateLoanFlow:

   - borrower: The party receiving the loan (e.g., a company or individual).
   - lender: The party providing the loan (e.g., a financial institution).
   - loanAmount: The principal amount of the loan.
   - interestRate: The interest rate on the loan.
   - maturityDate: The date when the loan is due to be repaid in full.
   - loanType: The type of loan (e.g., mortgage, auto, or personal).

   b. PoolLoansFlow:

   - loanIds: A list of unique identifiers for the loans to be pooled.
   - poolCreator: The party responsible for creating the asset pool (e.g., a financial institution or a special purpose entity).

2. *Asset-backed Securities (ABS) Issuance and Tranching:*

   a. IssueABSFlow:

   - assetPoolId: The unique identifier for the asset pool backing the ABS.
   - issuer: The party responsible for issuing the asset-backed securities (e.g., a special purpose entity).
   - totalSecurities: The total number of asset-backed securities to be issued.

   b. TrancheABSFlow:

   - absId: The unique identifier for the asset-backed securities to be tranched.
   - trancheSizes: A list of sizes for each tranche, representing the proportion of the total ABS.
   - trancheRiskProfiles: A list of risk profiles associated with each tranche (e.g., senior, mezzanine, or equity).

3. *Servicing, Payment Distribution, and Investor Relations:*

a. CollectPaymentsFlow:

- loanId: The unique identifier for the loan being repaid.
- borrower: The party making the payment.
- paymentAmount: The amount of the payment, including principal and interest.
- paymentDate: The date when the payment is made.

b. DistributePaymentsFlow:

- absId: The unique identifier for the asset-backed securities whose investors will receive payments.
- paymentDistribution: A mapping of investor parties to the amounts they will receive as payments.
- paymentDate: The date when the payments are distributed.