Kafka Case Study - Loan Processing

Processing of streaming data is a very frequent requirement in all industries. In the financial industry stream processing systems are required for instant decision making. Some sample use cases are

1. Getting a stream of stock prices and deciding to sell or buy

In today’s example we will simulate a loan processing system. In every loan processing system a loan application is sent through multiple checks before it reaches a loan officer who will approve or reject the loan application. Some of the checks maybe

1. Loan amount is more than 20 times the salary
2. Customer already has a loan and taking the new loan will exceed the 20 times salary rule
3. Credit score of the customer is beyond a threshold

Kafka is a real time streaming system. That can be used to process a continuous stream of messages. In today’s example we will use Kafka to read loan applications and make various checks on it before storing it in a file that can then be reviewed by an officer.

# Problem Statement

In this problem we assume that a loan processing system is collecting the loan applications and putting them into a kafka topic. The loan applications are for existing customers and the messages are in json format with the following structure:

### Input Json Message Format

{ "customer\_id": 10010, "loan\_application\_amount": 10101 }

Customer Id: id of the customer

Loan\_application\_amount: total amount of loan applied

### External Information

We have the following external information

1. A file with customer details like credit score and monthly salary
2. A file with customer historical information of all loans currently ongoing

With these information we have to decide if we should forward the application to the loan processing officer or not. To help us decide that there are certain rules that will be applied on the data. For simplicity we have just two rules now:

1. If credit score is below 700 then reject the application
2. If the total loan amount > 20 times the monthly salary then reject the application

## Data Flow

# Problem Statement

You have to create a python based solution that can

1. Read the messages from kafka
2. Apply the rules
3. Forward the application if it passes all rules (as of now just printing approved is sufficient)