**Fixed Deposit Module**

**Introduction to FD:**

A Fixed Deposit (FD), also known as ‘Term Deposit (TD)’, is a deposit held at a bank for a fixed term. A term deposit account allows customers to deposit money for a set period, thereby earning a higher rate of interest in return. These deposits have varying maturities, ranging anywhere from a day or a month to a few years.

When a term deposit is placed, the lender (the customer) understands that the money can only be withdrawn after the term has ended. In case of premature withdrawal, the bank may levy a penalty or not provide the interest rate as agreed for the full term.

When the term is over, the deposit can be withdrawn, or it can be held for another term, partly or fully.

Some banks may offer additional services to FD holders, such as loans against FD.

 FD investments are safe as they are covered by insurance corporations for a certain amount, which varies across different countries. They also offer income tax and wealth benefits.

Banks issue separate receipts for every FD because each deposit is treated as a distinct contract. This receipt is known as the Fixed Deposit Receipt (FDR), which must be surrendered to the bank at the time of renewal or encashment.

Many banks do give new instructions for the matured deposit. On the date of maturity, such deposits are renewed for a similar term as that of the original deposit at the rate prevailing on the date of renewal.

**Account Processing:**

1. **Account Creation using FD product:** All the parameters, like the term, rate, should be inherited from the product and stored on the account. It should be possible to customize these values on the account; the values set should be within the limits set on the product.
   * Account number 🡪 System generated, or user entered; can be string.

When autogenerated, build account number generation logic based on certain criteria.

* + 1. Should be of length 10 numbers
    2. First 3 digits represent the bank/branch, followed by a sequence of 6, and a check digit of 1.

[Check digit - Wikipedia](https://en.wikipedia.org/wiki/Check_digit#:~:text=Add%20the%20even%20number%20digits%3A%201%2B1%2B1%2B,digit%20x%20value%20is%205.)

Make sure that the account number is unique within the system, there should not be any duplicates, both when entered and auto-generated

As part of extensibility, build plugin for account number generation that can be replaced with another one that maps to account number generation of country which the team has chosen.

* + Account Identifier 🡪 system-generated internal identifier to be used in all other tables, to identify the accounts uniquely.
  + Product 🡪 Product code from which the account is built. The entered product code has to be validated in the Product and Pricing module and should be of type FD. The product should be active and should not be passive.
  + Account Status 🡪 Make the account status ‘Active’
  + Account Name 🡪 Any user-entered name that synchronizes with the customer’s name. No validation needed. It is free text. The account can be searched by account number or account name.
  + Term 🡪 The term of the account can be defaulted from the product or can be overwritten. Define the term in Months. When customized on the account cannot be less than or greater than the term limit set on the product.
  + Rate 🡪 Can be defaulted from product / overwritten on account. When customized on the account, it should be within the rate limit set on the product.
  + Amount 🡪 Can be defaulted from product / overwritten on account. When customized on the account, the amount should be within the amount limit set on the product.
  + Maturity Date 🡪 Using the account term and account effective date, and rate on the account, calculate the maturity date by calling the FD Calculator
  + Maturity amount 🡪 FD calculator should be used to get the Maturity amount. This amount should be stored on the account
  + Effective Date 🡪 The date from which the account is effective.

1. **Roles on the Account:** Develop a set of APIs for relating the account to the customer. More than one customer can be related to an account. The roles can be Owner, co-Owner, Nominee, etc.
   * Account Identifier
   * Role type
   * Customer ID 🡪 Use the customer from the customer module done in Fintech Lab
   * Percentage 🡪 Applicable if there are owner and co-owner, Nominee(in case of multiple) specifying the ownership percentage for each of the role
2. **Transaction on the account**: Account creation will create a deposit transaction on the account, which will create the principal balance.
3. **Issue Term Deposit Receipt:** The Account creation will issue a Term Deposit Receipt that can be sent to the customer as a notice by mail. This should contain the account number, customer number, product, term, interest rate, and Maturity date.

Send an alert SMS on account opening.

1. **Search the accounts:** There should be an option to search on accounts based on account number and account name, and Customer number.
2. **Report:** Reports should be generated listing the accounts created between dates(e.g., accounts opened in a month), accounts created in the date range for a user, for a bank branch, etc.
3. **Interest Calculation on a fixed frequency** 🡪 Batch process to calculate the interest based on the interest calculation frequency. It can be added to the principal or transferred to other accounts.

Send an alert on interest payment.

1. **Early Withdrawal** 🡪 In case of early withdrawal, a penalty is charged to the customer. The amount is reduced and transferred to another account. The account status is marked as closed.

Provide a service to calculate the pre-maturity amount.

1. **Maturity Processing** 🡪On Maturity, there are several options
   * Transfer the amount to another account, and close it
   * Renew the account with a new term

This should be a batch process that processes the matured FD accounts based on the maturity instructions provided on the account.

**The students, as part of this exercise, have to build the FD Module,**

* + A data structure to cater to the Term deposit account details. Get the ER reviewed and approved. ER is one of the deliverables.
  + Services for
    - Create the FD account
    - Get a List of accounts based on the search criteria like customer number, customer name, account name, etc. Search should also be based on
    - Get details of the individual account 🡪 which would include basic details, rate, balances, etc.
    - Perform transactions 🡪 Initial deposit, withdrawal, etc.
    - Get the list of transactions on the account by search criteria like date range, transaction types, like deposit, interest accrual, etc.
    - Premature withdrawal inquiry
    - Rate inquiry 🡪 To get the rates based on the amount limit, customer segments like employee, student, senior citizen, etc.
  + UI for the services
  + Alerts
    - When the account is created
    - When there is a transaction on the account
  + Notice
    - Term Deposit Receipt on account opening
    - Maturity Notice – 10 days before the maturity date
  + Statement
    - Combined statement for customer – having more than one TD based on statement frequency
  + Batch Jobs
    - Interest calculation
    - Maturity Processing
    - Notice
    - Statement
  + Reports 🡪 Generate reports for the bank
    - Account created for the day, for the month, between date range, etc.
    - Accounts that will be matured within a week, 3 days, etc.
    - Accounts prematurely closed for the given date range
    - Accounts closed for the given date range

File extracts 🡪 All active accounts for the given day

* + Integrate with Product and Pricing Module, FD calculator module.
  + Liveliness and Readiness Probe
  + API backward compatibility for Account creation API
  + Elasticity Check 🡪 Build a process to create accounts and build capability to scale up the pods or start new pods whichever is feasible (Horizontal or vertical scaling)
  + Code scanning
  + Integrating with ancillary components to send Email, SMS etc
  + Event 🡪 Create an event during account creation.
  + Extensibility 🡪 Account number generation