

FRD-105: Generate Unique Account Number

1. Functionality Summary

The system must generate a unique, valid account number for each new customer after KYC approval. Account numbers must follow MiniBank's defined structure, avoid collisions, and be stored in the ACCOUNT table. This account number is required for activation, transactions, and customer onboarding completion.

2. Detailed Functional Description

2.1 Account Number Structure

Component	Description
Bank Code	4-digit internal bank identifier (e.g., 1023)
Branch Code	3-digit branch identifier (e.g., 001)
Sequence Number	8-digit auto-increment sequence

2.2 Generation Flow

```
# ACCOUNT NUMBER FORMAT
<bankCode><branchCode><sequence>

# EXAMPLE
1023 001 00001234

# ENDPOINT
POST /account/generate

# HEADERS
Content-Type: application/json

# REQUEST
{
  "customerId": "UUID",
  "branchCode": "001"
}

# SERVER LOGIC
1. Fetch next sequence from ACCOUNT_SEQ table
2. Construct account number:
  accountNumber = bankCode + branchCode + paddedSequence
3. Check for collisions in ACCOUNT table
4. If collision → regenerate with new sequence
5. Insert new record in ACCOUNT table:
  customer_id, account_number, status='PENDING'

# RESPONSE (SUCCESS)
{
```

```

    "status": "SUCCESS",
    "accountNumber": "102300100001234"
}

# RESPONSE (FAILURE)
{
    "status": "FAILURE",
    "errorCode": "ERR-1054",
    "message": "Account number generation failed"
}

```

2.3 System Behavior

On successful generation:

- Account number inserted into ACCOUNT table
- Returned to the caller service

On sequence collision:

- System retries with next sequence value

On DB failure:

- Throw SYSTEM ERROR and return ERR-1054

3. Error Codes

Error Code	Description	When Triggered
ERR-1050	Branch code invalid	Branch code missing/invalid
ERR-1051	Cannot fetch next sequence	Sequence table error
ERR-1052	Account number collision	Already exists in ACCOUNT table
ERR-1053	DB insert failure	Insert operation fails
ERR-1054	Account generation failure	Unhandled exception

4. Preconditions

- KYC successfully approved (FRD-104).
- CUSTOMER record exists.
- ACCOUNT_SEQ table available and functional.

5. Postconditions

- Unique account number stored in ACCOUNT table.
- Account status set to PENDING.
- Ready for activation and Welcome Email trigger.

6. Acceptance Criteria

AC ID	Acceptance Criteria
AC-501	System generates unique account number as per structure.
AC-502	Sequence collisions retried until resolved.
AC-503	DB insert failure triggers ERR-1053.
AC-504	Generated account number returned to client.
AC-505	Audit logs capture generation event (masked).

7. Data Storage Impact

Table: ACCOUNT

- account_id (UUID)
- customer_id
- account_number
- branch_code
- status
- created_at

8. Non-Functional Requirements

- Account generation < 2 seconds.
- Zero collision tolerance.
- Sequence increments must be atomic.
- Supports 200 RPS.