Task 1: Converting Credentials from Text Files to Database Storage

Overview

This report details the implementation of a Python code that processes credential data from text files and stores them in a MySQL database. The script includes security measures such as password hashing.

Table schema for user

Using MySQL, the `user` table was created. The table creation query is given below:

```
CREATE TABLE CREDENTIAL.USER(
EMAIL VARCHAR(64) NOT NULL,
PASSWORD VARCHAR(64) NOT NULL
);
```

Converting text to database entries

Database Configuration

The script establishes a connection to a MySQL database with the following parameters:

- Host: localhost
- Database: credential
- User: root
- Password: Mnrpswrd1234

Data Processing Pipeline

1. File Reading Implementation
    - The `read_credentials()` function implements a generator pattern to process from large files
    - It reads the input file line by line, reducing memory usage
    - Credentials are expected in "email:password" format
    - Lines are split at the ":" character to separate email and password
2. Security Measures

- Both the email and password are hashed using SHA-256 before storage
- The `hash_credentials()` function processes each credential pair:
  - Converts inputs to UTF-8 encoding
  - Generates hexadecimal hash
  - Returns a tuple of (hashed_email, hashed_password)

3. Database Operations
   - Using `mysql-connector-python package`, parameterized MYSQL queries has been executed
   - A single database connection has been maintained throughout the process
   - Connection cleanup is handled properly

Error Handling

- The script implements try-except blocks to catch and report database errors
- Database transactions are committed in batches to ensure data consistency

First 10 rows of table USER

```
mysql> select * from credential.user limit 10;
+------------------------------------------------------------------+------------------------------------------------------------------+
| email                                                            | password                                                         |
+------------------------------------------------------------------+------------------------------------------------------------------+
| d990c537444ad2e3fa151b0b504742892eace4fd882d42a28a85246785464191 | 26578caf504a9bf64f8b2202c2a0214f1fb012ca0138eb72380b3acdc88f7b8e |
| 3f2f4c11ca097dafe7af474f6fb9a7245a2cda6171732ea3329864e8d0934693 | b74ccc96c3b05f2869c3789529adae392d559a98835b9b2b61d5e00ab73e8936 |
| 3384273284a1c97cb590fadbc3a376b0bd0c40628655d3390a1c7bfa3929327f | 9b0a475d12d122637a8642a1b7749211e8b5198ffe1a3c975cf55071314423 71 |
| 368bd3466c0bce0df70f97a43253b0ae6368a237a51c8879329f21b9e8b9500b | dda906af3039aaf0be15cbb4c137779af7c6eecb244c0f4852defb66ea91c512 |
| 92cb1e270abb28865f6b6c26b99606c15dea0d56af606eca6aa9bb5d2d9935a0 | f6f12487034b4490a10a7b27019c0cf08231bdf112e66267276092ec13b1035f |
| ddf96958b085bd4009b7412e65df3abf6c979f1789d773d27484cf4efab0347a | 0c5ccf02f7ea3581f2a2ffc2380b1a23eab528a72d18230c4a758fd3a8e99579 |
| 21125269ee85a08b09f818a7b36da76626aafed2df0fa0caf9fc0b90754a191f | b6354be027028ed292404562c303c722240137215ade7424bee15ccf5703c1cc |
| d3fea4052fb3ce1f039ea81789eb537747955d69b6a142ef268febfc2ff8fafe | d1ee43a7ec69aed180b8fae67a280004aeda46aa7d1dc0461a008d82c72ac3bd |
| eabc132e99e7a3645216851a979e3c9ada98e27a2aeaf8c5c64e32e0a81b606d | 402c2e8e9a64c0de71a8183dd9bd3d5b02c9fbbca81c9a60889764bac40930d6 |
| a0d132c752b58fbd5fa338b67b427a3416b2c9d8712539e18b3ba90e53d5f8a7 | 00c1a23c2ca43620dbec0c39dc04e0eda94530c7d8e6cce65f70c5062ad474c2 |
+------------------------------------------------------------------+------------------------------------------------------------------+
10 rows in set (0.00 sec)
```

Total rows of table USER

```
mysql> select count(*) from credential.user;
+----------+
| count(*) |
+----------+
| 25729332 |
+----------+
1 row in set (7.37 sec)
```