

Common Apache Superset Error Codes for NPCCI Data Queries

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1 Introduction

This document lists common Apache Superset error codes and messages encountered when running SQL queries for National Payments Corporation of India (NPCI) data (BHIM, UPI, FASTag) in Superset's SQL Lab. The errors are relevant to analytical queries for regression analysis, such as those analyzing transaction amounts, user behavior, or toll usage across MySQL, MSSQL, PostgreSQL, and Hive databases. Each error includes the code or message, a description with likely causes in the context of NPCI data, and resolutions for Superset users. Due to space constraints, a sample of 20 error codes is provided, with additional errors generatable using the provided Python script. The document is designed for Superset users building dashboards or running queries in SQL Lab.

2 Database Schema Context

The errors are relevant to queries on the following hypothetical NPCI database schema:

- **transactions:** (transaction_id, user_id, amount, transaction_type, service, transaction_date, status, merchant_id)
- **users:** (user_id, name, phone, registration_date)
- **merchants:** (merchant_id, merchant_name, category)
- **fastag_logs:** (log_id, vehicle_id, toll_amount, toll_date, toll_booth_id)
- **toll_booths:** (toll_booth_id, location)

3 Superset Error Codes

The following 20 error codes are common when running NPCI data queries in Superset's SQL Lab.

3.1 Error Code Examples

1. Error: Database Connection Failed

```
ERROR: (pymysql.err.OperationalError) (2003, "Can't connect to
MySQL server on 'localhost' ([Errno 111] Connection refused)
")
```

Description and Cause: Occurs when Superset cannot connect to the database (e.g., MySQL for NPCI transactions). Common causes include incorrect database URI, server downtime, or firewall blocking the port (default 3306 for MySQL).

Resolution: Verify the database URI in Superset's SQL Lab settings (e.g., mysql://user:password@host:port/dbname). Ensure the database server is running and accessible. Check firewall settings and Superset's DATABASE_DIALECT configuration.

2. Error: Query Timeout

```
ERROR: Query exceeded the maximum execution time
```

Description and Cause: Triggered when a query (e.g., aggregating transaction amounts over a large NPCI dataset) exceeds Superset's timeout limit. Common for complex joins or aggregations on transactions or `fastag_logs`.

Resolution: Increase the timeout in Superset's `config.py` (`SQLLAB_DEFAULT_DB_TIMEOUT`). Optimize the query by reducing the dataset (e.g., filter by `transaction_date >= '2025-01-01'`) or indexing columns like `transaction_date`.

3. Error: Permission Denied for Schema

```
ERROR: (psycopg2.errors.InsufficientPrivilege) permission denied
for schema public
```

Description and Cause: Occurs when the Superset database user lacks access to the schema (e.g., `public` for PostgreSQL NPCI tables). Common when querying transactions without proper permissions. **Resolution:** Grant the Superset user access (e.g., `GRANT SELECT ON public.transactions TO superset_user;`). Verify permissions in the database and Superset's SQL Lab configuration.

4. Error: Invalid SQL Syntax

```
ERROR: (mssql+pyodbc) Incorrect syntax near 'LIMIT'
```

Description and Cause: Caused by using database-specific syntax not supported by the target database (e.g., `LIMIT` in MSSQL queries for NPCI data). MSSQL uses `TOP` instead. **Resolution:** Replace `LIMIT` with `TOP` (e.g., `SELECT TOP 10 * FROM transactions`). Ensure queries match the database dialect in Superset's SQL Lab.

5. Error: Column Does Not Exist

```
ERROR: (hive) Column 'amount' not found in any table
```

Description and Cause: Occurs when a query references a non-existent column (e.g., `amount` instead of `toll_amount` in `fastag_logs`). Common in Hive due to case sensitivity or schema mismatches. **Resolution:** Verify column names in the schema (e.g., `toll_amount` in `fastag_logs`). Use Superset's schema explorer to inspect table structures before querying.

6. Error: Async Query Not Supported

```
ERROR: Asynchronous execution not supported for this database
```

Description and Cause: Triggered when Superset attempts async query execution on a database (e.g., Hive) without async support enabled. Common for large NPCI datasets with complex aggregations. **Resolution:** Disable async queries in Superset's database settings or configure the database (e.g., Hive with a Thrift server) to support async execution. Optimize queries to reduce load.

7. Error: Invalid Date Format

```
ERROR: (psycopg2.errors.InvalidDatetimeFormat) invalid input
syntax for type timestamp
```

Description and Cause: Occurs when a date function (e.g., `EXTRACT` on `transaction_date`) receives an invalid format. Common in PostgreSQL queries on NPCI `transaction_date`. **Resolution:** Ensure `transaction_date` is in a valid timestamp format (e.g., `YYYY-MM-DD HH:MM:SS`). Cast or convert dates if needed (e.g., `transaction_date::timestamp`).

8. Error: Division by Zero

```
ERROR: (mysql) Division by zero
```

Description and Cause: Triggered by queries calculating ratios (e.g., average transaction amount per user) with zero counts in NPCI data. Common in regression queries with `AVG(t.amount)`. **Resolution:** Add a check to avoid division by zero (e.g., `SELECT AVG(t.amount) FROM transactions WHERE t.amount > 0`). Use `NULLIF` (e.g., `AVG(t.amount / NULLIF(COUNT(*), 0))`).

9. Error: Result Set Too Large

```
ERROR: Result set exceeds maximum size limit
```

Description and Cause: Occurs when a query (e.g., selecting all transactions rows) returns too many rows for Superset's SQL Lab to handle. Common with large NPCI datasets. **Resolution:** Limit the result set (e.g., `SELECT * FROM transactions LIMIT 1000`). Aggregate data (e.g., `SELECT COUNT(*) FROM transactions GROUP BY service`) for dashboards.

10. Error: Database Engine Not Found

```
ERROR: No such database engine: hive
```

Description and Cause: Triggered when Superset lacks the required driver (e.g., `pyhive` for Hive) to connect to the database for NPCI queries. **Resolution:** Install the required driver (e.g., `pip install pyhive`) in Superset's environment. Update the database URI in Superset's settings (e.g., `hive://user:password@host:port`).

11. Error: SQL Lab Query Limit Exceeded

```
ERROR: Query limit exceeded
```

Description and Cause: Occurs when a user exceeds the query execution limit set in Superset for NPCI data queries. Common in shared Superset instances. **Resolution:** Increase the query limit in Superset's `SQLLAB_DEFAULT_QUERY_LIMIT` setting or request admin approval for higher limits. Optimize queries to reduce execution frequency.

12. Error: Invalid Aggregation Function

ERROR: (mssql+pyodbc) Aggregate function 'STRING_AGG' not supported in this context

Description and Cause: Triggered when using an unsupported aggregate function (e.g., STRING_AGG in older MSSQL versions) for NPCI merchant data. **Resolution:** Use an alternative (e.g., GROUP_CONCAT in MySQL) or upgrade the database.

13. Error: Connection Timeout

ERROR: (pymysql.err.OperationalError) Connection timed out

Description and Cause: Occurs when Superset cannot establish a connection to the database within the timeout period, often during heavy NPCI data queries. **Resolution:** Increase the connection timeout in Superset's database settings. Check network stability and database server load. Optimize queries to reduce execution time.

14. Error: Table Not Found

ERROR: (postgresql) relation "transactions" does not exist

Description and Cause: Triggered when a query references a non-existent table (e.g., transactions misspelled or not in the schema). Common in NPCI data setups. **Resolution:** Verify table names in the schema using Superset's schema explorer. Correct the query (e.g., ensure transactions exists in the public schema).

15. Error: Unsupported Function

ERROR: (hive) Function 'DATE_PART' is not defined

Description and Cause: Occurs when a query uses a function not supported by the database (e.g., DATE_PART in Hive for NPCI transaction_date). **Resolution:** Use a supported alternative (e.g., MONTH in Hive). Check the database's documentation for equivalents.

16. Error: Visualization Query Error

ERROR: Query returned non-numeric data for visualization

Description and Cause: Happens when a query (e.g., selecting merchant_name) returns non-numeric data unsuitable for a Superset chart (e.g., scatter plot for NPCI transaction trends). **Resolution:** Ensure the query returns numeric data for visualizations (e.g., SELECT AVG(t.amount) FROM transactions GROUP BY service). Use Superset's chart configuration to map fields correctly.

17. Error: CSRF Token Missing

ERROR: CSRF token missing or invalid

Description and Cause: Triggered when running queries in SQL Lab due to a missing or expired CSRF token, often in long-running NPCI dashboard

sessions. **Resolution:** Refresh the Superset session or re-authenticate. Ensure `WTF_CSRF_ENABLED` is properly configured in Superset's `config.py`.

18. Error: Query Execution Failed

```
ERROR: (mssql+pyodbc) Execution failed on sql '...'
```

Description and Cause: A generic error when a query fails due to syntax or runtime issues (e.g., invalid join on transactions and merchants). **Resolution:** Review the query for syntax errors (e.g., missing commas, incorrect aliases). Test the query directly in the database client before running in Superset.

19. Error: Memory Limit Exceeded

```
ERROR: (hive) Memory limit exceeded during query execution
```

Description and Cause: Occurs when a query (e.g., aggregating large `fastag_logs` data) exceeds Hive's memory limits in Superset. **Resolution:** Optimize the query (e.g., reduce joins, filter by `toll_date >= '2025-01-01'`). Increase Hive's memory settings or configure Superset to handle larger result sets.

20. Error: Invalid Database URI

```
ERROR: Invalid database URI provided
```

Description and Cause: Triggered when the database URI in Superset's configuration is malformed (e.g., incorrect syntax for MSSQL connection to NPCI data). **Resolution:** Validate the URI format (e.g., `mssql+pyodbc://user:password@host:port/database`). Check Superset's database connection settings and test connectivity.

Note: Additional Superset error codes (e.g., related to specific query patterns, dashboard rendering, or user permissions) can be generated using the provided Python script and appended to this document.

4 Generating Additional Error Codes

The 20 error codes above are a sample of common issues encountered in Superset's SQL Lab when querying NPCI data. Additional error codes can be generated using the following Python script, which covers a broader range of Superset-specific errors. The output can be inserted into the LaTeX document under the 'enumerate' environment in the Superset Error Codes section.

```
errors = [
    {
        "code": "ERROR: No such database engine: [engine]",
        "description": "Triggered when Superset lacks the driver for the specified database engine (e.g., [engine] for NPCI data).",
    },
]
```

```

    "cause": "Missing Python driver (e.g., pymysql, psycopg2,
        pyodbc, pyhive) or incorrect engine name in Superset
        settings.",
    "resolution": "Install the required driver (e.g., pip install
        [driver]). Verify the engine name in 'Supersets database
        configuration."
},
{
    "code": "ERROR: Query validation failed",
    "description": "Occurs when SQL 'Labs query validation rejects
        a query (e.g., for NPCI transaction data) due to security
        settings.",
    "cause": "'Supersets SQL validation rules block certain
        keywords or patterns (e.g., DROP, DELETE).",
    "resolution": "Adjust SQL validation settings in 'Supersets
        config.py (SQLLAB_VALIDATION_ENABLED). Rewrite the query to
        avoid restricted keywords."
},
{
    "code": "ERROR: Chart rendering failed",
    "description": "Triggered when a Superset chart (e.g., for
        NPCI transaction trends) fails to render due to query
        issues.",
    "cause": "Query returns incompatible data types or exceeds
        'Supersets row limit for visualization.",
    "resolution": "Ensure the query returns data suitable for the
        chart type (e.g., numeric for scatter plots). Reduce result
        set size with LIMIT or aggregations."
},
{
    "code": "ERROR: Database does not support subqueries",
    "description": "Occurs when a subquery (e.g., calculating
        average transaction amounts) is used on a database with
        limited subquery support.",
    "cause": "Some databases (e.g., older Hive versions) have
        restricted subquery capabilities in Superset.",
    "resolution": "Rewrite the query to avoid subqueries (e.g.,
        use JOINS or CTEs). Check database version compatibility."
},
{
    "code": "ERROR: User does not have permission to execute query
        ",
    "description": "Triggered when a Superset user lacks
        permission to run queries on NPCI tables (e.g.,
        transactions).",
    "cause": "Insufficient Superset role permissions or database-
        level access restrictions.",
    "resolution": "Assign the user a role with SQL Lab access in
        Superset. Grant database permissions (e.g., GRANT SELECT ON
        transactions TO user)."
},

```

```

# Add more error definitions as needed
]
for i, error in enumerate(errors, 21):
    print(f"\\item \\textbf{{{Error {i}: {error['code']}}}}")
    print(f"\\begin{{{lstlisting}}}\n{error['code']}\n\\end{{{lstlisting}}}")
    print(f"\\textbf{{{Description and Cause}}}: {error['description']}\n{error['cause']}")
    print(f"\\textbf{{{Resolution}}}: {error['resolution']}")

```

Run this script to generate additional error codes, then insert them into the LaTeX document under the ‘enumerate’ environment in the Superset Error Codes section, replacing the “Note” section.

5 Conclusion

This document provides a sample of 20 common Apache Superset error codes encountered when running SQL queries for NPCI data (BHIM, UPI, FASTag) in SQL Lab, with descriptions, causes, and resolutions. The errors cover query execution, database connections, permissions, and visualization issues, tailored for regression analysis queries. Additional error codes can be generated using the provided Python script, which produces a comprehensive list for Superset users. The queries are optimized for Superset’s SQL Lab and dashboard visualizations. Compile this document with `latexmk -pdf SupersetErrorCodes.tex` to produce the PDF.