HSN & SAC Code API - Software Documentation

1. Introduction

This Go application provides an API to retrieve HSN (Harmonized System of Nomenclature) and SAC (Service Accounting Code) data. The data is extracted from an Excel file and stored in a PostgreSQL database. The application uses the Gin framework to expose an API endpoint for querying HSN and SAC codes.

2. Features

- Read HSN and SAC data from an Excel file

- Store and retrieve data from PostgreSQL

- Expose a REST API for querying HSN and SAC codes

- Handle database connection errors and API responses

3. Technologies Used

- Programming Language: Go

- Framework: Gin (for API)

- Database: PostgreSQL

- Libraries:

  - github.com/gin-gonic/gin (Web framework)

  - github.com/lib/pq (PostgreSQL driver)

  - github.com/xuri/excelize/v2 (Excel file handling)

4. Prerequisites

- Go installed on your system

- PostgreSQL database setup

- HSN_SAC.xlsx file available in the project directory

- Required Go modules installed (run):

```
go mod tidy
```

5. Installation & Setup

5.1 Database Configuration

Update the PostgreSQL credentials in the code:

```
const (
  host     = "localhost"
  port     = 5432
  user     = "Postgres"
  password = "suryakk07"
  dbname   = "hsn-db"
)
```

Ensure that the hsn_mstr and sac_mstr tables exist in your database.

5.2 Running the Application

1. Clone the repository and navigate to the project directory.

2. Ensure PostgreSQL is running.

3. Run the application:

```
go run test.go
```

4. The API server will start at: http://localhost:8080

6. API Endpoints

6.1 Retrieve HSN & SAC Codes

- Endpoint: GET /hsn_sac

- Description: Fetches a list of HSN and SAC codes with their descriptions.

- Response Format:

```
[
  {
    "hsn_code": "010512",
    "hsn_desc": "TURKEYS",
    "sac_code": "995473",
    "sac_desc": "Painting services"
  }
]
```

7. Code Structure

7.1 Read Excel Data

```
func readExcel() {
  f, err := excelize.OpenFile("HSN_SAC.xlsx")
```

```
  ...
}
```

7.2 Database Connection

```
db, err := sql.Open("postgres", fmt.Sprintf(
  "host=%s port=%d user=%s password=%s dbname=%s sslmode=disable",
  host, port, user, password, dbname,
))
```

7.3 API Endpoint Handler

```
r.GET("/hsn_sac", func(c *gin.Context) {
  query := `
    SELECT
      h.hsn_code,
      h.description AS hsn_desc,
      COALESCE(s.sac_code, '') AS sac_code,
      COALESCE(s.description, '') AS sac_desc
    FROM
      hsn_mstr h
    LEFT JOIN
      sac_mstr s
    ON
      h.hsn_code = s.hsn_code;
  `
  ...
})
```

8. Error Handling

- Handles errors when reading the Excel file

- Handles database connection errors

- Returns appropriate HTTP status codes for API errors

9. Future Enhancements

- Add an endpoint to upload and process Excel files dynamically

- Implement authentication and authorization

- Support filtering and pagination for large datasets

10. Conclusion

This application provides a simple API to query HSN and SAC codes. It integrates an Excel reader and a PostgreSQL database for data management, ensuring efficient retrieval of information. Further enhancements can be made to improve its scalability and security.