

```
import sqlite3
import csv
import os
```

```
class DatabaseConnector:
```

```
    """ Manages a connection to a SQLite database and populates it with data from CSV files. """
```

```
    def __init__(self, database_file):
```

```
        # Initialize the database connection and create tables
```

```
        self.connection = sqlite3.connect(database_file)
```

```
        self.cursor = self.connection.cursor()
```

```
        self.create_tables()
```

```
    def create_tables(self):
```

```
        """ Creates necessary tables in the database if they don't already exist. """
```

```
        # Create product table
```

```
        self.cursor.execute("""
```

```
            CREATE TABLE IF NOT EXISTS product (
                id INTEGER PRIMARY KEY AUTOINCREMENT,
                name TEXT UNIQUE
```

```
            );
```

```
        """)
```

```
        # Create shipment table
```

```
        self.cursor.execute("""
```

```
            CREATE TABLE IF NOT EXISTS shipment (
                id INTEGER PRIMARY KEY AUTOINCREMENT,
                product_id INTEGER,
                quantity INTEGER,
                origin TEXT,
                destination TEXT,
                FOREIGN KEY (product_id) REFERENCES product(id)
```

```
            );
```

```
        """)
```

```
        self.connection.commit()
```

```
    def populate(self, folder):
```

```
        """ Populates the database with data from the CSV files in the specified folder. """
```

```
        file_paths = [
```

```
            os.path.join(folder, "shipping_data_0.csv"),
```

```
            os.path.join(folder, "shipping_data_1.csv"),
```

```
            os.path.join(folder, "shipping_data_2.csv")
```

```
        ]
```

```
        try:
```

```
            # Open all CSV files
```

```
            with open(file_paths[0], newline='') as file_0, \
```

```
                open(file_paths[1], newline='') as file_1, \
```

```
                open(file_paths[2], newline='') as file_2:
```

```
                reader_0 = csv.reader(file_0)
```

```
                reader_1 = csv.reader(file_1)
```

```
                reader_2 = csv.reader(file_2)
```

```
            # Populate data from the CSV files
```

```
            self.populate_shipping_data_1(reader_0)
```

```

        self.populate_shipping_data_2(reader_1, reader_2)

    except FileNotFoundError as e:
        print(f"Error: {e}. Ensure the CSV files exist in the specified folder.")
    except Exception as e:
        print(f"An error occurred: {e}")

def populate_shipping_data_1(self, reader_0):
    """ Populates the database with data from the first CSV file. """
    for row_idx, row in enumerate(reader_0):
        if row_idx > 0:
            product_name = row[2]
            try:
                product_quantity = int(row[4]) # Convert quantity to integer
            except ValueError:
                print(f"Warning: Invalid quantity '{row[4]}' in row {row_idx}. Skipping.")
                continue
            origin = row[0]
            destination = row[1]

            self.insert_product(product_name)
            self.insert_shipment(product_name, product_quantity, origin, destination)

def populate_shipping_data_2(self, reader_1, reader_2):
    """ Populates the database with data from the second and third CSV files. """
    shipment_info = {}

    # Read and store shipment information
    for row_idx, row in enumerate(reader_2):
        if row_idx > 0:
            shipment_identifier = row[0]
            shipment_info[shipment_identifier] = {
                "origin": row[1],
                "destination": row[2],
                "products": {}
            }

    # Aggregate product data for each shipment
    for row_idx, row in enumerate(reader_1):
        if row_idx > 0:
            shipment_identifier = row[0]
            product_name = row[1]
            if shipment_identifier in shipment_info:
                products = shipment_info[shipment_identifier]["products"]
                products[product_name] = products.get(product_name, 0) + 1

    # Insert aggregated product and shipment data
    for shipment in shipment_info.values():
        for product_name, product_quantity in shipment["products"].items():
            self.insert_product(product_name)
            self.insert_shipment(product_name, product_quantity, shipment["origin"],
shipment["destination"])

def insert_product(self, product_name):
    """ Inserts a new product into the database if it does not already exist. """

```

```

query = 'INSERT OR IGNORE INTO product(name) VALUES(?);'
try:
    self.cursor.execute(query, (product_name,))
    self.connection.commit()
except sqlite3.Error as e:
    print(f"Error inserting product '{product_name}': {e}")

def insert_shipment(self, product_name, product_quantity, origin, destination):
    """ Inserts a new shipment into the database. """
    query = 'SELECT id FROM product WHERE name = ?;'
    self.cursor.execute(query, (product_name,))
    result = self.cursor.fetchone()

    if result:
        product_id = result[0]
        query = 'INSERT INTO shipment(product_id, quantity, origin, destination) VALUES(?,?,?,?);'
        try:
            self.cursor.execute(query, (product_id, product_quantity, origin, destination))
            self.connection.commit()
        except sqlite3.Error as e:
            print(f"Error inserting shipment for product '{product_name}': {e}")
    else:
        print(f"Warning: Product '{product_name}' not found in the database.")

def close(self):
    """ Closes the database connection. """
    self.connection.close()

if __name__ == '__main__':
    db_connector = DatabaseConnector("shipment_database.db")
    db_connector.populate("./data")
    db_connector.close()

```