In [1]:
```python
pds_data = {
    "taluk1": {
        "shop101": {
            "name": "PDS Shop A",
            "address": "123 Main Street, Taluk 1",
            "products": [
                {"name": "Rice", "price": 20, "quantity": 100},
                {"name": "Wheat", "price": 15, "quantity": 150},
                {"name": "Sugar", "price": 30, "quantity": 50}
            ]
        },
        "shop102": {
            "name": "PDS Shop B",
            "address": "456 Oak Avenue, Taluk 1",
            "products": [
                {"name": "Rice", "price": 22, "quantity": 80},
                {"name": "Wheat", "price": 16, "quantity": 120}
            ]
        }
    },
    "taluk2": {
        "shop201": {
            "name": "PDS Shop X",
            "address": "789 Pine Lane, Taluk 2",
            "products": [
                {"name": "Rice", "price": 21, "quantity": 200},
                {"name": "Oil", "price": 80, "quantity": 70}
            ]
        }
    }
}
```

In [2]:
```python
def display_shops_in_taluk(taluk_name):
    taluk_shops = pds_data.get(taluk_name) # Using .get() to handle non-e

    if taluk_shops: # Check if the taluk exists and has shops
        print(f"Shops in {taluk_name}:")
        for shop_id, shop_info in taluk_shops.items():
            print(f"  Shop ID: {shop_id}, Name: {shop_info['name']}, Addr
    else:
        print(f"No PDS shops found in {taluk_name}. Please check the talu
```

In [3]:
```python
def add_or_update_product(taluk_name, shop_id, product_name, price, quant
    if taluk_name in pds_data and shop_id in pds_data[taluk_name]:
        shop_products = pds_data[taluk_name][shop_id]["products"]
        found = False
        for product in shop_products:
            if product["name"] == product_name:
                product["price"] = price
                product["quantity"] = quantity
                found = True
                print(f"Updated {product_name} in {pds_data[taluk_name][s
                break
        if not found:
            shop_products.append({"name": product_name, "price": price, "
            print(f"Added {product_name} to {pds_data[taluk_name][shop_id
```

```python
        else:
            print("Invalid taluk or shop ID.")
```

```python
In [4]: def get_products_in_taluk(taluk_name):
            products_in_taluk = {}
            if taluk_name in pds_data:
                for shop_id, shop_info in pds_data[taluk_name].items():
                    for product in shop_info["products"]:
                        product_name = product["name"]
                        if product_name not in products_in_taluk:
                            products_in_taluk[product_name] = {"total_quantity":
                        products_in_taluk[product_name]["total_quantity"] += prod
                        products_in_taluk[product_name]["shops"].append({
                            "shop_id": shop_id,
                            "shop_name": shop_info["name"],
                            "quantity": product["quantity"],
                            "price": product["price"]
                        })
                return products_in_taluk
            else:
                return None   # No products found for the given taluk
```

```python
In [ ]: # Initial PDS Data
        pds_data = {
            "taluk1": {
                "shop101": {
                    "name": "PDS Shop A",
                    "address": "123 Main Street, Taluk 1",
                    "products": [
                        {"name": "Rice", "price": 20, "quantity": 100},
                        {"name": "Wheat", "price": 15, "quantity": 150},
                        {"name": "Sugar", "price": 30, "quantity": 50}
                    ]
                },
                "shop102": {
                    "name": "PDS Shop B",
                    "address": "456 Oak Avenue, Taluk 1",
                    "products": [
                        {"name": "Rice", "price": 22, "quantity": 80},
                        {"name": "Wheat", "price": 16, "quantity": 120}
                    ]
                }
            },
            "taluk2": {
                "shop201": {
                    "name": "PDS Shop X",
                    "address": "789 Pine Lane, Taluk 2",
                    "products": [
                        {"name": "Rice", "price": 21, "quantity": 200},
                        {"name": "Oil", "price": 80, "quantity": 70}
                    ]
                }
            }
        }

        # --- Functions (as defined above) ---

        def display_shops_in_taluk(taluk_name):
            taluk_shops = pds_data.get(taluk_name) # Using .get() to handle non-e
```

```python
        if taluk_shops:  # Check if the taluk exists and has shops
            print(f"Shops in {taluk_name}:")
            for shop_id, shop_info in taluk_shops.items():
                print(f"  Shop ID: {shop_id}, Name: {shop_info['name']}, Addr
        else:
            print(f"No PDS shops found in {taluk_name}. Please check the talu

def add_or_update_product(taluk_name, shop_id, product_name, price, quant
    if taluk_name in pds_data and shop_id in pds_data[taluk_name]:
        shop_products = pds_data[taluk_name][shop_id]["products"]
        found = False
        for product in shop_products:
            if product["name"] == product_name:
                product["price"] = price
                product["quantity"] = quantity
                found = True
                print(f"Updated {product_name} in {pds_data[taluk_name][s
                break
        if not found:
            shop_products.append({"name": product_name, "price": price, "
            print(f"Added {product_name} to {pds_data[taluk_name][shop_id
    else:
        print("Invalid taluk or shop ID.")

def get_products_in_taluk(taluk_name):
    products_in_taluk = {}
    if taluk_name in pds_data:
        for shop_id, shop_info in pds_data[taluk_name].items():
            for product in shop_info["products"]:
                product_name = product["name"]
                if product_name not in products_in_taluk:
                    products_in_taluk[product_name] = {"total_quantity":
                products_in_taluk[product_name]["total_quantity"] += prod
                products_in_taluk[product_name]["shops"].append({
                    "shop_id": shop_id,
                    "shop_name": shop_info["name"],
                    "quantity": product["quantity"],
                    "price": product["price"]
                })
        return products_in_taluk
    else:
        return None  # No products found for the given taluk

# --- Main Program Loop (Menu-driven) ---

while True:
    print("\n--- PDS Management System ---")
    print("1. View shops in a Taluk")
    print("2. Add/Update product in a shop")
    print("3. View products available in a Taluk")
    print("4. Exit")

    choice = input("Enter your choice: ")

    if choice == '1':
        taluk_name = input("Enter taluk name: ")
        display_shops_in_taluk(taluk_name)
    elif choice == '2':
        taluk_name = input("Enter taluk name: ")
```

```python
        shop_id = input("Enter shop ID: ")
        product_name = input("Enter product name: ")
        price = float(input("Enter product price: "))
        quantity = int(input("Enter product quantity: "))
        add_or_update_product(taluk_name, shop_id, product_name, price, q
    elif choice == '3':
        taluk_name = input("Enter taluk name: ")
        products = get_products_in_taluk(taluk_name)
        if products:
            print(f"Products available in {taluk_name}:")
            for product_name, details in products.items():
                print(f"  {product_name}: Total Quantity = {details['tota
                for shop_detail in details["shops"]:
                    print(f"    - Shop: {shop_detail['shop_name']} ({shop
        else:
            print(f"No products found for {taluk_name}.")
    elif choice == '4':
        print("Exiting PDS Management System. Goodbye!")
        break
    else:
        print("Invalid choice. Please try again.")
```

```
--- PDS Management System ---
1. View shops in a Taluk
2. Add/Update product in a shop
3. View products available in a Taluk
4. Exit
Shops in taluk1:
  Shop ID: shop101, Name: PDS Shop A, Address: 123 Main Street, Taluk 1
  Shop ID: shop102, Name: PDS Shop B, Address: 456 Oak Avenue, Taluk 1

--- PDS Management System ---
1. View shops in a Taluk
2. Add/Update product in a shop
3. View products available in a Taluk
4. Exit
Invalid taluk or shop ID.

--- PDS Management System ---
1. View shops in a Taluk
2. Add/Update product in a shop
3. View products available in a Taluk
4. Exit
```

In [ ]: