Inventory Management System - SQL Script


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            "This table will store information about each product, such as its name, price, and cate
            "\n",
            "**Structure:**\n",
            "\n",
            "| Column Name | Data Type | Description |\n",
            "| --- | --- | --- |\n",
            "| product\\_id | INT | Unique identifier for each product (Primary Key) |\n",
            "| product\\_name | VARCHAR(255) | Name of the product |\n",
            "| price | DECIMAL(10, 2) | Price of the product |\n",
            "| category | VARCHAR(100) | Category to which the product belongs |"
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            "    product_name VARCHAR(255) NOT NULL,\r\n",
            "    price DECIMAL(10, 2) NOT NULL,\r\n",
            "    category VARCHAR(100)\r\n",
            ");\r\n",
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            "**Suppliers Table:**\n",
            "\n",
            "This table will store supplier details, including contact information.\n",
            "\n",
            "**Structure:**\n",
            "\n",
            "| Column Name | Data Type | Description |\n",
            "| --- | --- | --- |\n",
            "| supplier\\_id | INT | Unique identifier for each supplier (Primary Key) |\n",
            "| supplier\\_name | VARCHAR(255) | Name of the supplier |\n",
            "| contact\\_email | VARCHAR(255) | Email address of the supplier |\n",
            "| phone\\_number | VARCHAR(15) | Contact number of the supplier |"
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            "    supplier_name VARCHAR(255) NOT NULL,\r\n",
            "    contact_email VARCHAR(255),\r\n",
            "    phone_number VARCHAR(15)\r\n",
            ");\r\n",
            ""
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            "\n",
            "**Structure:**\n",
            "\n",
            "| Column Name | Data Type | Description |\n",
            "| --- | --- | --- |\n",
            "| inventory\\_id | INT | Unique identifier for each inventory record (Primary Key) |\n",
            "| product\\_id | INT | Foreign Key (references product\\_id in Products) |\n",
            "| quantity | INT | Current stock quantity of the product |\n",
            "| supplier\\_id | INT | Foreign Key (references supplier\\_id in Suppliers) |\n",
            "| last\\_updated | DATE | Date when the stock was last updated |"
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            "    product_id INT,\r\n",
            "    quantity INT DEFAULT 0,\r\n",
            "    supplier_id INT,\r\n",
            "    last_updated DATE DEFAULT (CURRENT_DATE),\r\n",
            "    FOREIGN KEY (product_id) REFERENCES Products(product_id),\r\n",
            "    FOREIGN KEY (supplier_id) REFERENCES Suppliers(supplier_id)\r\n",
            ");\r\n",
            ""
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            "\n",
            "This table will record product transactions, either purchases (stocking up) or sales (r
            "\n",
            "**Structure:**\n",
            "\n",
            "| Column Name | Data Type | Description |\n",
            "| --- | --- | --- |\n",
            "| transaction\\_id | INT | Unique identifier for each transaction (Primary Key) |\n",
            "| product\\_id | INT | Foreign Key (references product\\_id in Products) |\n",
            "| transaction\\_type | ENUM('sale', 'purchase') | Indicates whether the transaction is
            "| transaction\\_date | DATE | Date when the transaction took place |\n",
            "| quantity | INT | Number of products involved in the transaction |"
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            "CREATE TABLE Transactions (\r\n",
            "    transaction_id INT NOT NULL AUTO_INCREMENT PRIMARY KEY,\r\n",
            "    product_id INT,\r\n",
            "    transaction_type ENUM('sale', 'purchase') NOT NULL,\r\n",
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            "    transaction_date DATE DEFAULT (CURRENT_DATE),\r\n",
            "    quantity INT NOT NULL,\r\n",
            "    FOREIGN KEY (product_id) REFERENCES Products(product_id)\r\n",
            ");\r\n",
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            "-- Insert sample products into Products table\r\n",
            "INSERT INTO Products (product_name, price, category) VALUES\r\n",
            "('Laptop', 1200.00, 'Electronics'),\r\n",
            "('Desk Chair', 150.00, 'Furniture'),\r\n",
            "('Notebook', 2.50, 'Stationery');\r\n",
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        "-- Insert sample suppliers into Suppliers table\r\n",
        "INSERT INTO Suppliers (supplier_name, contact_email, phone_number) VALUES\r\n",
        "('Tech Supplies Co.', 'contact@techsupplies.com', '1234567890'),\r\n",
        "('Office Furniture Inc.', 'support@officefurniture.com', '0987654321');\r\n",
        ""
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        "-- Insert initial inventory levels for products\r\n",
        "INSERT INTO Inventory (product_id, quantity, supplier_id) VALUES\r\n",
        "(1, 10, 1), -- Laptop from Tech Supplies Co.\r\n",
        "(2, 20, 2), -- Desk Chair from Office Furniture Inc.\r\n",
        "(3, 100, 2); -- Notebook from Office Furniture Inc.\r\n",
        ""
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            "-- Insert sample transactions\r\n",
            "INSERT INTO Transactions (product_id, transaction_type, quantity) VALUES\r\n",
            "(1, 'purchase', 10), -- Purchased 10 laptops\r\n",
            "(2, 'purchase', 20), -- Purchased 20 desk chairs\r\n",
            "(3, 'purchase', 100); -- Purchased 100 notebooks\r\n",
            "-- Sales transaction: selling 5 laptops\r\n",
            "INSERT INTO Transactions (product_id, transaction_type, quantity) VALUES\r\n",
            "(1, 'sale', 5);\r\n",
            ""
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            "**Basic Functionalities:**\n",
            "\n",
            "- **Add New Products:** Functionality to add new products to the inventory, including d
            "- **Update Product Information:** Ability to update product details such as name, quant
            "- **Track Stock Levels:** Monitor the stock levels of each product, alerting when a pro
            "- **Record Sales Transactions:** Track sales, reduce the stock count when a product is
            "- **View Product Details:** Display information on each product, including stock quanti
            "- **Generate Inventory Reports:** Generate reports on stock levels, sales trends, or lo
            "- **Search Products:** Search for products by name or category to quickly find items in
            "- **Delete Products:** Remove outdated or discontinued products from the inventory."
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            "-- Select the product name and quantity from the Products and Inventory tables\r\n",
            "SELECT p.product_name, i.quantity\r\n",
            "-- Join the Inventory table with the Products table using the product_id\r\n",
            "FROM Inventory i\r\n",
            "JOIN Products p ON i.product_id = p.product_id;\r\n",
            ""
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                                }
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                        },
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                            {
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                                "quantity": "10"
                            },
                            {
                                "product_name": "Desk Chair",
                                "quantity": "20"
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                                "product_name": "Notebook",
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            "This query retrieves the **current stock levels** by displaying the product names along
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            "-- Update Stock After a Sale\r\n",
            "-- Decrease the quantity of the product with product_id 2 (desks) by 3 units after a sa
            "UPDATE Inventory\r\n",
            "SET quantity = quantity - 3\r\n",
            "WHERE product_id = 2;\r\n",
            "\r\n",
            "-- Update Stock After a Purchase\r\n",
            "-- Increase the quantity of the product with product_id 1 (laptops) by 10 units after a
            "UPDATE Inventory\r\n",
            "SET quantity = quantity + 10\r\n",
            "WHERE product_id = 1;\r\n",
            ""
```

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                            {
                                "name": "product_id"
                            },
                            {
                                "name": "quantity"
                            },
                            {
                                "name": "supplier_id"
```

```
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            "The first query **updates the inventory after a sale** by **decreasing** the quantity o
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            "-- To view the purchase and sale history for a specific product, use the following quer
            "-- This query retrieves the transaction history for a specific product with product_id
            "SELECT t.transaction_type, t.quantity, t.transaction_date\r\n",
            "FROM Transactions t\r\n",
            "JOIN Products p ON t.product_id = p.product_id -- Joining Transactions and Products tab
            "WHERE p.product_id = 1; -- Filtering for product_id 1\r\n",
            ""
        ],
```

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            "-- This query identifies products that have stock levels below a certain threshold, suc
            "-- View products with low stock (e.g., less than 5 units)\r\n",
            "SELECT p.product_name, i.quantity\r\n",
            "FROM Inventory i\r\n",
            "JOIN Products p ON i.product_id = p.product_id -- Joining Inventory and Products tables
            "WHERE i.quantity < 5; -- Filtering for products with stock levels less than 5\r\n",
            ""
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            "This query retrieves a list of products that have low stock levels, specifically those
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        "-- To generate a report showing the total number of products sold in a given month:\r\n
        "-- Generate a sales report for the current month\r\n",
        "SELECT p.product_name, SUM(t.quantity) AS total_sold -- Selecting product name and tota
        "FROM Transactions t\r\n",
        "JOIN Products p ON t.product_id = p.product_id -- Joining Transactions with Products on
        "WHERE t.transaction_type = 'sale' -- Filtering for sales transactions\r\n",
        "AND t.transaction_date BETWEEN '2024-10-01' AND '2024-10-31' -- Considering sales withi
        "GROUP BY p.product_name; -- Grouping results by product name to aggregate total sold\r\
        ""
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                        ]
                    },
                    "data": []
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        }
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    "execution_count": 22
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{
```

```
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        "\n",
        "This query **generates a sales report** that displays the total number of products sold
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        "**Query-6: Reorder Products with Low Stock**"
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    "attachments": {}
},
{
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        "-- Automatically identify products that need to be reordered (e.g., products with stock
        "-- Reorder products with stock less than 5 units\r\n",
        "SELECT p.product_name, i.quantity -- Selecting product name and current stock quantity\
        "FROM Inventory i\r\n",
        "JOIN Products p ON i.product_id = p.product_id -- Joining Inventory with Products on pr
        "WHERE i.quantity < 5; -- Filtering for products that have a stock quantity less than 5\
        ""
    ],
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```

```
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        "\n",
        "This query **identifies products that require reordering** by selecting the names and c
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{
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    "source": [
        "-- Insert a new product 'Monitor' into the Products table with category 'Electronics' a
        "INSERT INTO Products (product_name, category, price)\r\n",
        "VALUES ('Monitor', 'Electronics', 150.00);\r\n",
        "\r\n",
        "-- Insert an initial stock quantity of 20 for the new product in the Inventory table\r\
        "-- The product_id is retrieved using a subquery that selects the product_id for 'Monito
        "INSERT INTO Inventory (product_id, quantity)\r\n",
        "VALUES ((SELECT product_id FROM Products WHERE product_name = 'Monitor'), 20);\r\n",
        ""
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```
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                            {
                                "name": "product_name"
                            },
                            {
                                "name": "price"
                            },
                            {
                                "name": "category"
                            }
                        ]
                    },
                    "data": [
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                            "price": "1200.00",
                            "category": "Electronics"
                        },
                        {
                            "product_id": "2",
                            "product_name": "Desk Chair",
                            "price": "150.00",
                            "category": "Furniture"
                        },
                        {
                            "product_id": "3",
```

```
                            "product_name": "Notebook",
                            "price": "2.50",
                            "category": "Stationery"
                        },
                        {
                            "product_id": "4",
                            "product_name": "Monitor",
                            "price": "150.00",
                            "category": "Electronics"
                        }
                    ]
                },
                "text/html": "<table><tr><th>product_id</th><th>product_name</th><th>price</th><
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            "metadata": {}
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        "**Query-8: Delete a Product from the Inventory**"
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    "attachments": {}
},
{
    "cell_type": "code",
    "source": [
        "-- Delete the product with product_id = 3 from the Inventory table to avoid foreign key
        "DELETE FROM Inventory WHERE product_id = 3;\r\n",
        "\r\n",
        "-- After removing it from Inventory, delete the product from the Products table\r\n",
        "DELETE FROM Products WHERE product_id = 3;\r\n",
        ""
    ],
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            },
            "metadata": {}
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            "metadata": {}
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            "traceback": []
        }
    ],
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        "**Explanation:**\n",
```

```
            "\n",
            "The provided SQL code performs two deletion operations. First, it deletes the product w
        ],
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                                {
                                    "name": "product_id"
                                },
                                {
                                    "name": "quantity"
                                },
                                {
                                    "name": "supplier_id"
                                },
                                {
                                    "name": "last_updated"
                                }
                            ]
                        },
                        "data": [
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                                "product_id": "1",
                                "quantity": "20",
                                "supplier_id": "1",
                                "last_updated": "2025-09-26"
                            },
                            {
                                "inventory_id": "2",
                                "product_id": "2",
                                "quantity": "17",
                                "supplier_id": "2",
                                "last_updated": "2025-09-26"
                            },
```

```
                        {
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                            "product_id": "4",
                            "quantity": "20",
                            "supplier_id": "NULL",
                            "last_updated": "2025-09-26"
                        }
                    ]
                },
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            },
            "metadata": {}
        }
    ],
    "execution_count": 27
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                                "name": "price"
                            },
                            {
                                "name": "category"
                            }
                        ]
                    },
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                            "product_name": "Laptop",
                            "price": "1200.00",
                            "category": "Electronics"
                        },
                        {
                            "product_id": "2",
                            "product_name": "Desk Chair",
                            "price": "150.00",
```

```
                            "category": "Furniture"
                        },
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                            "product_id": "3",
                            "product_name": "Notebook",
                            "price": "2.50",
                            "category": "Stationery"
                        },
                        {
                            "product_id": "4",
                            "product_name": "Monitor",
                            "price": "150.00",
                            "category": "Electronics"
                        }
                    ]
                },
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            },
            "metadata": {}
        }
    ],
    "execution_count": 28
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        "**Query-9: View Products by Category**"
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    },
    "attachments": {}
},
{
    "cell_type": "code",
    "source": [
        "-- Select the product name and price from the Products table\r\n",
        "SELECT product_name, price\r\n",
        "-- Filter results to show only products in the 'Electronics' category\r\n",
        "FROM Products\r\n",
        "WHERE category = 'Electronics';\r\n",
        ""
    ],
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```

```
                            },
                            {
                                "name": "price"
                            }
                        ]
                    },
                    "data": [
                        {
                            "product_name": "Laptop",
                            "price": "1200.00"
                        },
                        {
                            "product_name": "Monitor",
                            "price": "150.00"
                        }
                    ]
                },
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    },
    "attachments": {}
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        "**Query-10: Check Total Value of Inventory**"
    ],
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        "language": "sql",
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    },
    "attachments": {}
},
{
    "cell_type": "code",
    "source": [
        "-- Select the product name, quantity, price, and calculate total value for each product
        "SELECT p.product_name, i.quantity, p.price, \r\n",
        "       (i.quantity * p.price) AS total_value\r\n",
        "-- Join the Inventory table with the Products table based on product_id\r\n",
        "FROM Inventory i\r\n",
        "JOIN Products p ON i.product_id = p.product_id;\r\n",
        ""
    ],
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```
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                                },
                                {
                                    "name": "price"
                                },
                                {
                                    "name": "total_value"
                                }
                            ]
                        },
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                                "quantity": "20",
                                "price": "1200.00",
                                "total_value": "24000.00"
                            },
                            {
                                "product_name": "Desk Chair",
                                "quantity": "17",
                                "price": "150.00",
                                "total_value": "2550.00"
                            },
                            {
                                "product_name": "Monitor",
                                "quantity": "20",
                                "price": "150.00",
                                "total_value": "3000.00"
                            }
                        ]
                    },
                    "text/html": "<table><tr><th>product_name</th><th>quantity</th><th>price</th><th
                },
                "metadata": {}
            }
        ],
        "execution_count": 30
    },
    {
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            "**Explanation:**\n",
            "\n",
            "This SQL query retrieves the product\\_name, quantity, price, and the total\\_value (ca
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            "**Query-11: View Products Not Sold in a Given Period**"
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            "-- Left join Products with Transactions to include all products, even those with no mat
            "SELECT p.product_name\r\n",
            "FROM Products p\r\n",
            "LEFT JOIN Transactions t ON p.product_id = t.product_id \r\n",
            "-- Only consider transactions that are of type 'sale'\r\n",
            "AND t.transaction_type = 'sale'\r\n",
            "-- Filter for products with no transaction or transactions before September 1, 2024\r\n
            "WHERE t.transaction_date IS NULL OR t.transaction_date < '2024-09-01';\r\n",
            ""
        ],
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                "metadata": {}
            },
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                "output_type": "execute_result",
                "execution_count": 31,
                "data": {
                    "application/vnd.dataresource+json": {
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                            "fields": [
                                {
                                    "name": "product_name"
                                }
                            ]
                        },
                        "data": [
                            {
                                "product_name": "Desk Chair"
                            },
                            {
                                "product_name": "Notebook"
                            },
                            {
                                "product_name": "Monitor"
                            }
                        ]
                    },
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                "metadata": {}
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        ],
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    {
        "cell_type": "markdown",
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            "**Explanation:**\n",
```

```
            "\n",
            "This SQL query retrieves the product\\_name from the Products table for products that e
        ],
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            "SELECT *from TRANSACTIONS"
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                                },
                                {
                                    "name": "product_id"
                                },
                                {
                                    "name": "transaction_type"
                                },
                                {
                                    "name": "transaction_date"
                                },
                                {
                                    "name": "quantity"
                                }
                            ]
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                            {
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                                "product_id": "1",
```

```
                                "transaction_type": "purchase",
                                "transaction_date": "2025-09-26",
                                "quantity": "10"
                            },
                            {
                                "transaction_id": "2",
                                "product_id": "2",
                                "transaction_type": "purchase",
                                "transaction_date": "2025-09-26",
                                "quantity": "20"
                            },
                            {
                                "transaction_id": "3",
                                "product_id": "3",
                                "transaction_type": "purchase",
                                "transaction_date": "2025-09-26",
                                "quantity": "100"
                            },
                            {
                                "transaction_id": "4",
                                "product_id": "1",
                                "transaction_type": "sale",
                                "transaction_date": "2025-09-26",
                                "quantity": "5"
                            }
                        ]
                    },
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                },
                "metadata": {}
            }
        ],
        "execution_count": 33
    },
    {
        "cell_type": "code",
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            "-- Calculate the total revenue by multiplying the quantity sold by the product price\r\
            "SELECT SUM(t.quantity * p.price) AS total_revenue\r\n",
            "-- Join the Transactions table with the Products table to access product price\r\n",
            "FROM Transactions t\r\n",
            "JOIN Products p ON t.product_id = p.product_id\r\n",
            "-- Filter for only 'sale' transactions\r\n",
            "WHERE t.transaction_type = 'sale'\r\n",
            "-- Only include transactions within the date range of October 1 to October 31, 2024\r\n
            "AND t.transaction_date BETWEEN '2024-10-01' AND '2024-10-31';\r\n",
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```

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                            "total_revenue": "NULL"
                        }
                    ]
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{
    "cell_type": "code",
    "source": [
        "-- Select the product name and the total quantity sold\r\n",
        "SELECT p.product_name, SUM(t.quantity) AS total_sold\r\n",
        "-- Join the Transactions table with the Products table to link products to transactions
        "FROM Transactions t\r\n",
        "JOIN Products p ON t.product_id = p.product_id\r\n",
        "-- Filter for only 'sale' transactions\r\n",
        "WHERE t.transaction_type = 'sale'\r\n",
        "-- Only include transactions that occurred between October 1 and October 31, 2024\r\n",
        "AND t.transaction_date BETWEEN '2024-10-01' AND '2024-10-31'\r\n",
        "-- Group the results by product name to calculate the total quantity sold for each prod
        "GROUP BY p.product_name\r\n",
        "-- Order the products by the total quantity sold in descending order (most sold first)\
        "ORDER BY total_sold DESC\r\n",
        "-- Limit the result to the top-selling product (one result)\r\n",
        "LIMIT 1;\r\n",
        ""
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            "output_type": "execute_result",
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                                    }
                                ]
                            },
                            "data": []
                        },
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                    "metadata": {}
                }
            ],
            "execution_count": 34
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    ]
}
```