**Scenario:**

You are analyzing weekly sales and production data for a bakery. Use the data provided below.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Day** | **Bread** | **Cakes** | **Cookies** | **Muffins** | **Pies** |
| Monday | 20 | 15 | 50 | 10 | 5 |
| Tuesday | 25 | 18 | 55 | 12 | 6 |
| Wednesday | 22 | 16 | 52 | 11 | 7 |
| Thursday | 30 | 20 | 60 | 15 | 10 |
| Friday | 35 | 25 | 65 | 20 | 15 |
| Saturday | 40 | 30 | 70 | 25 | 18 |

Cost price for each product (per item):  
**Bread**: $10, **Cakes**: $50, **Cookies**: $5, **Muffins**: $12, **Pies**: $20

### Questions:

#### ****Basic Operations****

1. Calculate the total items sold for each product over the week.
2. Find the average number of items sold for each product across all days.
3. Determine the total revenue for the week if the selling prices of bread, cakes, cookies, muffins, and pies are $15, $70, $8, $18, and $30, respectively.
4. Find out how much profit each product generated during the week, considering the cost price and sales data.
5. Identify the maximum number of items sold for any product during the week.

#### ****Hint: Combine Two Data Sources****

1. Add a new dataset representing leftover inventory for each product at the end of the week. Combine this with the sales data to calculate the total inventory used.
2. Create a dataset showing sales for two consecutive weeks by analyzing another bakery branch’s sales, which mirrors your data.

#### ****Hint: Group Data****

1. Divide the weekly sales data into two periods: weekdays and weekends, and analyze each period separately.
2. Separate the product cost prices into two categories: one for high-value products (cakes and pies) and another for low-value products (bread, cookies, and muffins).

#### ****Hint: Search Specific Data****

1. Find the day of the week when the highest number of pies was sold.
2. Identify all the days where more than 60 cookies were sold.

#### ****Hint: Sort Data****

12. Organize the sales data for muffins from the least sold day to the most sold day.

13. Reorder the daily sales data based on bread sales, showing the best-performing days first.

#### ****Hint: Retrieve Specific Data****

14. Extract the sales data for Wednesday to analyze the mid-week performance.

15. Retrieve the sales data for muffins for only the weekend days.

#### ****Hint: Work with Parts of the Data****

16. Focus on the first three products (bread, cakes, cookies) and calculate their sales totals for the week.

17. Loop through the daily sales and print the total sales for each day individually.

#### ****Hint: Modify and Protect Data****

1. Make a duplicate of the sales data to account for a potential 10% increase in demand without affecting the original data.
2. Confirm that updates to the duplicate sales data (e.g., applying discounts) do not change the original data.

#### ****Hint: Adjust Data Layout****

1. Rearrange the sales data into a single row to display all sales in sequential order.
2. Change the structure of the sales data to have 5 rows and 7 columns instead of 7 rows and 5 columns, ensuring the data integrity is maintained.

#### ****Hint: Use Special Matrices****

1. Apply a 5x5 matrix where the diagonal values represent a specific product’s promotional discount (use identity values). Calculate the adjusted cost prices.
2. Use a diagonal matrix to highlight the importance of individual products based on their contribution to revenue.

#### ****Hint: Unique Patterns****

1. Create a diagonal structure representing the selling prices of the products and use it to calculate the revenue in a new way.
2. Simulate a dataset where only the diagonal values represent products with consistent daily sales.

#### ****Hint: Insights from Groups****

1. Compare total weekday sales to total weekend sales for all products.
2. Identify which product sells the most during the weekend compared to weekdays.

#### ****Hint: Modify Data for Insights****

1. Replace Friday's sales figures with the average sales for Monday through Thursday and analyze the change.
2. Remove the sales data for Sunday and calculate the weekly totals for the remaining six days.
3. Reshape the weekend sales into a single row and compare the totals for Saturday and Sunday.