

DS Assignment

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

Answers:

```
sales_data = {  
    'Bread': [20, 25, 22, 30, 35, 40],  
    'Cakes': [15, 18, 16, 20, 25, 30],  
    'Cookies': [50, 55, 52, 60, 65, 70],  
    'Muffins': [10, 12, 11, 15, 20, 25],  
    'Pies': [5, 6, 7, 10, 15, 18]  
}
```

Cost and Selling Prices

```
cost_prices = {'Bread': 10, 'Cakes': 50, 'Cookies': 5, 'Muffins': 12, 'Pies': 20}  
selling_prices = {'Bread': 15, 'Cakes': 70, 'Cookies': 8, 'Muffins': 18, 'Pies': 30}
```

1. Total items sold for each product over the week

```
total_sold = {product: sum(sales) for product, sales in sales_data.items()}  
print("Total Items Sold:", total_sold)
```

O/P

Total Items Sold: {

'Bread': 172,

```
'Cakes': 124,  
'Cookies': 352,  
'Muffins': 93,  
'Pies': 61  
}
```

2. Average number of items sold for each product

```
average_sold = {product: sum(sales)/len(sales) for product, sales in sales_data.items()}  
print("Average Items Sold:", average_sold)
```

O/P

```
Average Items Sold: {  
    'Bread': 28.666666666666668,  
    'Cakes': 20.666666666666668,  
    'Cookies': 58.666666666666664,  
    'Muffins': 15.5,  
    'Pies': 10.166666666666666  
}
```

3. Total revenue for the week

```
total_revenue = {product: total_sold[product] * selling_prices[product] for product in  
sales_data}  
print("Total Revenue per Product:", total_revenue)  
print("Total Revenue for the week:", sum(total_revenue.values()))
```

O/P

```
Total Revenue per Product: {  
    'Bread': 2580,  
    'Cakes': 8680,  
    'Cookies': 2816,  
    'Muffins': 1674,  
    'Pies': 1830  
}
```

Total Revenue for the week: 17580

4. Total profit for each product

```
total_profit = {  
    product: (selling_prices[product] - cost_prices[product]) * total_sold[product]  
    for product in sales_data  
}  
  
print("Total Profit per Product:", total_profit)  
print("Total Profit for the week:", sum(total_profit.values()))
```

O/P

Total Profit per Product: {

```
    'Bread': 860,  
    'Cakes': 2480,  
    'Cookies': 1056,  
    'Muffins': 558,  
    'Pies': 610
```

}

Total Profit for the week: 5564

5. Maximum number of items sold for any product during the week

```
max_sold = max(  
    [(product, max(sales)) for product, sales in sales_data.items()],  
    key=lambda x: x[1]  
)  
  
print("Maximum number of items sold:", max_sold[1], "(", max_sold[0], ")")
```

O/P

Maximum number of items sold: 70 (Cookies)

6. Add a new dataset for leftover inventory and calculate total inventory used.

```
leftover_inventory = {  
    'Bread': 10,  
    'Cakes': 5,  
    'Cookies': 20,  
    'Muffins': 8,  
    'Pies': 3  
}  
  
inventory_used = {product: total_sold[product] + leftover_inventory[product] for product in  
sales_data}  
  
print("Total Inventory Used:", inventory_used)
```

O/P

Total Inventory Used: {'Bread': 182, 'Cakes': 129, 'Cookies': 372, 'Muffins': 101, 'Pies': 64}

7. Create a second week dataset (mirror data) and combine it.

```
sales_data_week2 = {product: sales.copy() for product, sales in sales_data.items()}  
  
combined_total = {product: sum(sales_data[product]) + sum(sales_data_week2[product])  
for product in sales_data}  
  
print("Combined Total Sales (2 Weeks):", combined_total)
```

O/P

Combined Total Sales (2 Weeks): {'Bread': 344, 'Cakes': 248, 'Cookies': 704, 'Muffins': 186,
'Pies': 122}

8. Divide sales into weekdays (Mon-Fri) and weekends (Sat) and analyze separately.

```
weekdays_sales = {product: sum(sales[:5]) for product, sales in sales_data.items()}  
  
weekend_sales = {product: sales[5] for product, sales in sales_data.items()}  
  
print("Weekdays Sales:", weekdays_sales)  
  
print("Weekend Sales:", weekend_sales)
```

O/P

Weekdays Sales: {'Bread': 132, 'Cakes': 94, 'Cookies': 282, 'Muffins': 68, 'Pies': 43}

Weekend Sales: {'Bread': 40, 'Cakes': 30, 'Cookies': 70, 'Muffins': 25, 'Pies': 18}

9. Separate product cost prices into high-value (cakes, pies) and low-value.

```
high_value = {product: price for product, price in cost_prices.items() if product in ['Cakes', 'Pies']}
```

```
low_value = {product: price for product, price in cost_prices.items() if product not in ['Cakes', 'Pies']}
```

```
print("High Value Products:", high_value)
```

```
print("Low Value Products:", low_value)
```

O/P

High Value Products: {'Cakes': 50, 'Pies': 20}

Low Value Products: {'Bread': 10, 'Cookies': 5, 'Muffins': 12}

10. Find the day when the highest number of pies was sold.

```
days = ['Monday', 'Tuesday', 'Wednesday', 'Thursday', 'Friday', 'Saturday']
```

```
max_pies = max(enumerate(sales_data['Pies']), key=lambda x: x[1])
```

```
print(f"Highest Pies Sold: {max_pies[1]} on {days[max_pies[0]]}")
```

O/P

Highest Pies Sold: 18 on Saturday