**Week 6: Data Analysis with What-If Scenarios**

**Dataset:** Sales Data for a Retail Store

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Product ID** | **Product Name** | **Category** | **Current Price** | **Unit Cost** | **Units Sold** | **Total Revenue** | **Total Cost** | **Profit** |
| 101 | Widget A | Gadgets | 20 | 10 | 200 | 4000 | 2000 | 2000 |
| 102 | Widget B | Gadgets | 15 | 8 | 300 | 4500 | 2400 | 2100 |
| 103 | Gadget X | Devices | 50 | 30 | 100 | 5000 | 3000 | 2000 |
| 104 | Gadget Y | Devices | 45 | 25 | 150 | 6750 | 3750 | 3000 |
| 105 | Thingamajig | Accessories | 5 | 2 | 500 | 2500 | 1000 | 1500 |
| 106 | Doodad | Accessories | 10 | 5 | 400 | 4000 | 2000 | 2000 |
| 107 | Gizmo Z | Tools | 35 | 20 | 200 | 7000 | 4000 | 3000 |
| 108 | Gizmo Q | Tools | 40 | 22 | 150 | 6000 | 3300 | 2700 |

**Exercises for Data Analysis with What-If Scenarios:**

**1. What-If: Change in Selling Price**

Objective: Analyze how a change in the selling price affects total revenue and profit for "Widget A."

Steps:

1. Create a copy of the current price and name it "New Price."

2. Change "New Price" for "Widget A" to different values (e.g., $18, $22).

3. Calculate the new total revenue and profit based on the new prices using the formula `=New Price \* Units Sold` for total revenue and `=New Total Revenue - Total Cost` for profit.

**2. What-If: Increase in Unit Cost**

Objective: Analyze the impact of an increase in unit cost on profit for "Gizmo Z."

Steps:

1. Increase the "Unit Cost" for "Gizmo Z" by 10%.

2. Calculate the new total cost using the formula `=Unit Cost \* Units Sold`.

3. Recalculate profit using `=Total Revenue - New Total Cost`.

**3. What-If: Discount on All Products**

Objective: Apply a 10% discount on the current prices of all products and analyze the impact on total revenue.

Steps:

1. Create a new column "Discounted Price" and calculate it using `=Current Price \* 0.9`.

2. Calculate new total revenue using `=Discounted Price \* Units Sold`.

3. Sum the new total revenue for all products to see the overall impact.

**4. What-If: Increase in Units Sold**

Objective: Analyze how an increase in units sold by 20% affects total revenue and profit for all products.

Steps:

1. Create a new column "New Units Sold" and calculate it using `=Units Sold \* 1.2`.

2. Calculate new total revenue and profit based on the increased units sold using `=Current Price \* New Units Sold` for total revenue and `=New Total Revenue - Total Cost` for profit.

**5. What-If: Fixed Costs Addition**

Objective: Determine the impact of adding a fixed cost of $5000 on the overall profit.

Steps:

1. Calculate the total profit for all products.

2. Subtract the fixed cost from the total profit using `=Total Profit - 5000`.

**6. What-If: Change in Sales Mix**

Objective: Analyze how changing the sales mix (selling more "Gadget X" and less "Widget B") affects total revenue and profit.

Steps:

1. Increase the units sold for "Gadget X" by 50 units and decrease "Widget B" by 50 units.

2. Calculate the new total revenue and profit using the new units sold values.

**7. What-If: Seasonal Sales Increase**

Objective: Apply a 30% increase in sales for all products during a seasonal promotion and analyze the impact on total revenue.

Steps:

1. Create a new column "Seasonal Units Sold" and calculate it using `=Units Sold \* 1.3`.

2. Calculate new total revenue using `=Current Price \* Seasonal Units Sold`.

**8. What-If: Volume Discount Impact**

Objective: Apply a volume discount of 5% for orders of more than 300 units and analyze the impact on total revenue.

Steps:

1. Create a new column "Discounted Price for Volume" and calculate it using `=IF(Units Sold > 300, Current Price \* 0.95, Current Price)`.

2. Calculate new total revenue using `=Discounted Price for Volume \* Units Sold`.

**9. What-If: Profit Margin Adjustment**

Objective: Adjust the profit margin for all products to 40% and analyze the new selling price and profit.

Steps:

1. Calculate the new selling price using the desired profit margin formula: `=Unit Cost / (1 - Desired Margin)`.

2. Calculate the new profit using `=New Selling Price \* Units Sold - Total Cost`.

**10. What-If: Break-Even Analysis**

Objective: Determine the break-even point in units for "Gizmo Q."

Steps:

1. Calculate the break-even point using the formula: `=Fixed Costs / (Selling Price - Unit Cost)`.

2. Use $5000 as the fixed cost for this analysis.