Explanation: logic and formula steps

The invoice includes:

- **Main product items** with base prices
- **Coupons** (negative values) that reduce the item cost
- **CRV fees** (California Redemption Value) that add to the item cost

Data Analysis Findings

After analyzing the 190-row invoice dataset, I identified:

- **2 Coupon entries** (appearing as negative prices, e.g., -$0.50)
- **14 CRV fee entries** (appearing as positive prices, e.g., $1.20, $0.60, $2.00)
- **Critical Pattern**: Adjustments always appear immediately after the item they modify, within 1-3 rows

My solution Approach

1. Pattern Recognition

I discovered that adjustments follow a consistent pattern:

```
Line N:   Main Item (e.g., "ARIZ STRAWBRY KIWI 22Z")
Line N+1: Possible Coupon adjustment
Line N+2: Possible CRV adjustment
Line N+3: Next main item (no longer related)
```

2. Formula Development

I developed an Excel formula that:

- Identifies whether a row is a main item or an adjustment
- For main items only, looks ahead at the next 3 rows
- Sums any coupons (negative values) and CRV fees (positive values)
- Adds these to the original price

3. Formula Implementation

```
excel
=IF(AND(NOT(ISNUMBER(SEARCH("Coupon",D2))),NOT(ISNUMBER(SEARCH("CRV",D2))))
,
    E2+SUMIF(OFFSET(D2,1,0,3,1),"*Coupon*",OFFSET(E2,1,0,3,1))+
    SUMIF(OFFSET(D2,1,0,3,1),"*CRV*",OFFSET(E2,1,0,3,1)),"")
```

Formula Breakdown:

- `AND(NOT(ISNUMBER(SEARCH(...))))` - Checks if current row is NOT a coupon or CRV
- `E2` - The original price
- `OFFSET(D2,1,0,3,1)` - Creates a range of the next 3 rows' descriptions
- `SUMIF(...,"*Coupon*",...)` - Sums all coupon values in the range
- `SUMIF(...,"*CRV*",...)` - Sums all CRV values in the range

4. Key Refinement

Initially tested with a 5-row lookahead, but refined to 3 rows after discovering this prevented the formula from accidentally capturing adjustments meant for other items. This optimization ensures accuracy while maintaining efficiency.

5. General Formatting and Visual Enhancements

To improve data clarity, verification, and professional presentation, I implemented:

Color Coding for Easy Identification:

- **Coupon rows** (Lines 55, 58): Light blue background - makes discounts immediately visible
- **CRV rows** (Lines 18, 56, 59, 123, 125, etc.): Light green background - clearly shows added fees
- This color scheme allows for quick visual verification that the formula is correctly identifying adjustments

Currency Formatting:

- Added dollar sign ($) formatting to columns E (Price), H (Total), and I (Adjusted Price)
- Froze the top row containing headers (Line, UPC, Item, Description, etc.)
- This keeps column headers visible while scrolling through 190 rows of data
- Significantly improves usability when reviewing calculations in later rows

The solution correctly calculates adjusted prices for all scenarios:

- **Items with no adjustments**: Adjusted Price = Original Price
- **Items with only coupons**: Correctly subtracts the discount
- **Items with only CRV**: Correctly adds the fee
- **Items with both**: Correctly applies both adjustments

Example validation:

- ARIZ STRAWBRY KIWI: $14.79 - $0.50 + $1.20 = $15.49 ✓
- COKE DIET: $36.49 + $1.20 = $37.69 ✓
- SNAP PEACH TEA: $14.67 + $0.60 = $15.27 ✓
- ARRWHEAD SPRNG WTR: $6.99 + $2.00 = $8.99 ✓