

Inventory Management Scenario with Variants

Sample Inventory Data:

```
$inventory = [  
  [  
    "name" => "Laptop",  
    "variants" => [  
      ["model" => "X123", "color" => "Silver", "size" => "15-inch", "quantity" => 5, "price" => 700],  
      ["model" => "X124", "color" => "Black", "size" => "13-inch", "quantity" => 3, "price" => 650],  
    ],  
    "in_stock" => true,  
  ],  
  [  
    "name" => "Mouse",  
    "variants" => [  
      ["model" => "M001", "color" => "Black", "size" => "Standard", "quantity" => 10, "price" => 25],  
      ["model" => "M002", "color" => "White", "size" => "Compact", "quantity" => 5, "price" => 30],  
    ],  
    "in_stock" => true,  
  ],  
  [  
    "name" => "Keyboard",  
    "variants" => [  
      ["model" => "K001", "color" => "Black", "size" => "Full", "quantity" => 0, "price" => 30],  
      ["model" => "K002", "color" => "White", "size" => "Compact", "quantity" => 2, "price" => 28],  
    ],  
    "in_stock" => false,  
  ],  
  [  
    "name" => "Monitor",  
    "variants" => [  
      ["model" => "M001", "color" => "Black", "size" => "24-inch", "quantity" => 2, "price" => 150],  
      ["model" => "M002", "color" => "Silver", "size" => "27-inch", "quantity" => 4, "price" => 180],  
    ],  
    "in_stock" => true,  
  ],  
  [  
    "name" => "USB Cable",  
    "variants" => [  
      ["model" => "U001", "color" => "Black", "size" => "1m", "quantity" => 15, "price" => 5],  
      ["model" => "U002", "color" => "White", "size" => "2m", "quantity" => 20, "price" => 6],  
    ],  
    "in_stock" => true,  
  ],  
];
```

1. Check Stock Status for Variants Using If-Else

Function Name: `checkStockStatus($inventory)`

Description: This function should loop through all the products and check if any variant has a quantity greater than zero. If so, print that the variant is in stock; otherwise, print that it's out of stock.

Expected Output:

Laptop X123 Silver 15-inch is in stock with 5 units available.
Laptop X124 Black 13-inch is in stock with 3 units available.
Mouse M001 Black Standard is in stock with 10 units available.
Mouse M002 White Compact is in stock with 5 units available.
Keyboard K001 Black Full is out of stock.
Keyboard K002 White Compact is in stock with 2 units available.
Monitor M001 Black 24-inch is in stock with 2 units available.
Monitor M002 Silver 27-inch is in stock with 4 units available.
USB Cable U001 Black 1m is in stock with 15 units available.
USB Cable U002 White 2m is in stock with 20 units available.

2. Calculate Total Inventory Value for Variants Using a For Loop

Function Name: `calculateTotalInventoryValue($inventory)`

Description: This function should calculate the total value of the items in stock by multiplying the `quantity` of each variant by its `price`. Only in-stock variants should be considered.

Expected Output:

The total value of items in stock is \$5070.

Explanation: The calculation involves summing the values of all variants that are in stock:

- Laptop: $5 * 700 + 3 * 650 = 3350$

- Mouse: $10 * 25 + 5 * 30 = 450$
 - Keyboard: $2 * 28 = 56$
 - Monitor: $2 * 150 + 4 * 180 = 1080$
 - USB Cable: $15 * 5 + 20 * 6 = 135$
-

3. Find Products with Low Stock Variants Using If-Else and Arrays

Function Name: `findLowStockVariants($inventory)`

Description: This function should find all variants with a `quantity` less than 5 and store their details in an array. Then print the names of the variants with low stock.

Expected Output:

Low stock variants:

- Keyboard K001 Black Full with 0 units
 - Laptop X124 Black 13-inch with 3 units
 - Mouse M002 White Compact with 5 units
-

4. Increase Inventory Quantities for Each Variant Using a For Loop

Function Name: `increaseInventoryQuantities($inventory, $increaseAmount)`

Description: This function should increase the `quantity` of each variant by a given `$increaseAmount` (e.g., 2). Then print the updated quantity of each variant.

Expected Output:

Laptop X123 Silver 15-inch now has 7 units.
Laptop X124 Black 13-inch now has 5 units.
Mouse M001 Black Standard now has 12 units.
Mouse M002 White Compact now has 7 units.
Keyboard K001 Black Full now has 2 units.
Keyboard K002 White Compact now has 4 units.
Monitor M001 Black 24-inch now has 4 units.
Monitor M002 Silver 27-inch now has 6 units.

USB Cable U001 Black 1m now has 17 units.

USB Cable U002 White 2m now has 22 units.

5. Calculate the Average Price of Variants for Each Product Using Arrays

Function Name: `calculateAveragePricePerProduct($inventory)`

Description: This function should calculate the average price of the variants for each product by summing the prices of all variants and dividing by the number of variants. Print the average price for each product.

Expected Output:

The average price of variants for Laptop is \$675.

The average price of variants for Mouse is \$27.5.

The average price of variants for Keyboard is \$29.

The average price of variants for Monitor is \$165.

The average price of variants for USB Cable is \$5.5.

Explanation:

- Laptop: $(700 + 650) / 2 = 675$
- Mouse: $(25 + 30) / 2 = 27.5$
- Keyboard: $(30 + 28) / 2 = 29$
- Monitor: $(150 + 180) / 2 = 165$
- USB Cable: $(5 + 6) / 2 = 5.5$

Notes for Students:

- **For Loops** should be used to iterate through products and variants.
- **If-Else Statements** should be used to check conditions like stock availability, low stock, etc.
- Be sure to store the results in **arrays** where necessary (e.g., low stock variants).
- Use functions to modularize the code and improve reusability.

