MINI PROJECT: "HP LAPTOPS"

PROGRAM: "cost and billing"

Source code: "python"

GitHub repository link:

https://github.com/sai-charan-123/bill_project.git

By

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HP Laptop Sales: Billing and Calculation Process

Introduction to the HP Laptop Sales Program

This document outlines the sales process for HP laptops, emphasizing the importance of accurate billing through the calculation of costs, taxes, and discounts. Each HP laptop has a fixed base price of **₹50,000**, which serves as the foundation for all subsequent calculations. The sales program is designed to streamline the transaction by allowing users to input the desired quantity of laptops, after which it dynamically computes the final payable amount.

Understanding the pricing structure is crucial for both customers and sales personnel. Alongside the base cost, the program accounts for two types of taxes: *State Goods and Services Tax (SGST)* and *Central Goods and Services Tax (CGST)*, each applied at a rate of 10%. These taxes are calculated on the total purchase amount before any discount is applied, ensuring compliance with tax regulations.

Moreover, the calculation of discounts plays a vital role in incentivizing bulk purchases. Different discount rates are offered depending on the volume of laptops being bought, encouraging larger orders while also providing cost benefits to the customer. By integrating taxes and discounts into the billing process, the program delivers a precise and transparent final payable amount.

This setup benefits retail business managers, sales staff, and accounting personnel by simplifying complex price computations into an automated flow. Users simply input the number of laptops they wish to purchase, and the program takes care of computing the total laptop cost, applicable taxes, discount amounts, and the net payable sum, thus facilitating quick and error-free billing.

Detailed Explanation of Tax Calculations

In the context of billing for HP laptops, two distinct taxes are applied to the total purchase amount prior to discount deduction: **State Goods and Services Tax (SGST)**

and **Central Goods and Services Tax (CGST)**. Both these taxes are essential components of the Indian Goods and Services Tax (GST) system, designed to streamline taxation and ensure fair revenue distribution between state and central governments.

Each tax is calculated at a fixed rate of 10% of the total laptop cost before any discounts. For instance, if a customer orders multiple laptops, the base price is multiplied by the quantity to obtain the total cost. Then, 10% of this amount is calculated separately for SGST and CGST. Mathematically, the tax amounts are computed as:

- **SGST:** = 10%
- **CGST:** = 10%

These taxes reflect the dual structure of GST, where SGST is collected by the state government where the sale occurs, and CGST is collected by the central government. This bifurcation ensures an equitable sharing of tax revenues.

The combined effect of these taxes means a total tax burden of 20% on the base price of the laptops before any discount is applied. Hence, the aggregate tax amount to be added is:

Incorporating both SGST and CGST into the billing calculation ensures adherence to taxation laws and accurately reflects the true cost of purchase. After these taxes are added, any eligible discounts based on purchase quantity are applied, resulting in the final payable amount. This comprehensive approach to tax calculation is fundamental for transparent and lawful retail transactions in the electronics industry.

Discount Structure and Its Application

The discount policy for the purchase of HP laptops is structured to reward customers with progressively higher discounts based on the quantity of laptops purchased. This tiered discount approach incentivizes bulk buying, allowing customers to benefit from significant cost reductions when ordering larger quantities. Below is the detailed discount structure:

Apply discount based on quantity

if 2 <= required_items <= 5:

   discount = 5 / 100

elif 5 <= required_items <= 10:

   discount = 10 / 100

elif 11 <= required_items <= 20:

   discount = 18 / 100

elif 21 <= required_items <= 40:

discount = 24 / 100

elif required_items >= 41:

   discount = 33 / 100

else:

   discount = 2 / 100

- **Fewer than 2 units:** A minimal discount of 2% is applied to encourage even small purchases.
- **2 to 5 units:** A discount rate of 5% is granted, recognizing moderate-sized purchases.
- **6 to 10 units:** The discount increases to 10%, rewarding customers placing larger orders.
- **11 to 20 units:** A significant discount of 18% is offered, promoting substantial bulk purchases.
- **21 to 40 units:** Customers enjoy a 24% discount, reflecting major volume buying benefits.
- **41 or more units:** The highest discount of 33% is applied, maximizing savings for very large orders.

This structured discount scale is carefully designed to balance profitability with competitive pricing. By increasing the discount percentage as the quantity rises, it encourages customers to increase their purchase volume to unlock better savings.

In terms of billing calculations, the discount percentage corresponding to the quantity purchased is applied to the total base cost of the laptops (quantity multiplied by ₹50,000). Importantly, the discount is calculated *after* the addition of SGST and CGST taxes to ensure accurate final pricing. The formula for the discount amount can be summarized as:

Discount Amount = Total Laptop Cost × Applicable Discount Rate

Where the *Total Laptop Cost* is the product of the number of laptops and the unit price, and the *Applicable Discount Rate* is selected based on the tier above.

By applying these discounts systematically, the billing process transparently reflects cost benefits, while also reinforcing a sales strategy focused on driving higher order volumes through attractive price incentives.

Step-by-Step Calculation of the Final Billing Amount

After the customer inputs the quantity of HP laptops they wish to purchase, the program proceeds through a systematic sequence of calculations to determine the final billing

amount. This step-by-step procedure ensures all components — base cost, taxes, discounts — are correctly applied, resulting in accurate and transparent invoicing.

1. Calculating the Total Laptop Cost

The first step is to compute the total cost of laptops before taxes and discounts. This is done by multiplying the unit price of a single HP laptop (₹50,000) by the number of laptops ordered:

Total Laptop Cost = Number of Laptops × Unit Price

2. Computing SGST and CGST

Once the base cost is established, the program calculates two taxes: State Goods and Services Tax (SGST) and Central Goods and Services Tax (CGST). Each tax is 10% of the total laptop cost:

- **SGST:** 0.10
- **CGST:** 0.10

These taxes are added to the total cost, increasing the invoice amount prior to discount calculation.

3. Determining the Discount Amount

Discounts are based on the quantity of laptops purchased and vary by tier, ranging from 2% for very small orders to 33% for the largest. The applicable discount percentage is applied to the base total cost (without taxes):

Discount Amount = Total Laptop Cost × Discount Rate
It is important to note that discount calculations use the pre-tax base cost to reflect the pricing strategy fairly.

4. Calculating the Final Payable Amount

Finally, the program computes the net amount payable by adding the SGST and CGST to the total laptop cost and then subtracting the discount amount:

Total Payable Amount = Total Laptop Cost + SGST + CGST – Discount Amount
Adhering to this calculation order is crucial: taxes must be added before applying the discount to maintain compliance with tax regulations and accurate billing.

Summary and User Interaction Experience

The billing summary clearly displays the breakdown of costs: the **total laptop cost**, followed by the applied **SGST** and **CGST** taxes, the **discount** based on purchase quantity, and the resulting **final payable amount**. These explicit details enhance

transparency, helping customers and sales staff understand each component of the invoice.

User interface elements like descriptive headers and a well-organized billing summary improve clarity and create a smooth interaction experience. This program is designed for retail use, providing quick, reliable billing. Future expansions may include additional product options or dynamic tax configurations to further support retail operations.

Source code:

```python
# Define the cost of the HP laptop
HP_LAPTOP_COST = 50000

# Define the tax rates
SGST = 10 / 100
CGST = 10 / 100

# Print the header
print("-------- We are selling HP Laptop --------\n")
print("-------- Each costs ₹", HP_LAPTOP_COST, "---------------\n")

# Get the number of items required
required_items = int(input("No. of required items: "))

# Apply discount based on quantity
if 2 <= required_items <= 5:
    discount = 5 / 100
elif 5 <= required_items <= 10:
    discount = 10 / 100
elif 11 <= required_items <= 20:
    discount = 18 / 100
elif 21 <= required_items <= 40:
    discount = 24 / 100
elif required_items >= 41:
```

```python
        discount = 33 / 100
    else:
        discount = 2 / 100


    # Calculations
    HP_total_cost = required_items * HP_LAPTOP_COST
    HP_SGST = HP_total_cost * SGST
    HP_CGST = HP_total_cost * CGST
    HP_discount_amount = HP_total_cost * discount


    # Calculate the total cost
    total_cost = HP_total_cost + HP_SGST + HP_CGST - HP_discount_amount


    # Output
    print("\n------------- Billing Summary --------------------")
    print(" \tTotal Laptop Cost          : ₹", HP_total_cost)
    print(" \tSGST (10%)                 : ₹", HP_SGST)
    print(" \tCGST (10%)                 : ₹", HP_CGST)
    print(" \tDiscount ({} %)       :{}" .format(int(discount * 100), HP_discount_amount))
    print("--------------------------------------------------")
    print(" \tTotal Payable Amount : ₹", total_cost)
    print("--------------------------------------------------")
    print(".<.<.< THANK YOU AND VISIT AGAIN >.>.>.")
```

Simple output (billing) :

```
D:\python\bill_project>python billing_source_.py
-------- We are selling HP Laptop --------

-------- Each costs ₹ 50000 ---------------

No. of required items: 5

-------------- Billing Summary ----------------------
      Total Laptop Cost                    : ₹ 250000
      SGST (10%)                           : ₹ 25000.0
      CGST (10%)                           : ₹ 25000.0
      Discount (5 %)             :12500.0
----------------------------------------------------
      Total Payable Amount : ₹ 287500.0
----------------------------------------------------
.<.<.< THANK YOU AND VISIT AGAIN >.>.>.
```