

AI ASSISTED CODING

LAB-3.5

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Batch-11

1. Select a simple task: "*Write a Python function to check if a number is prime.*"

Prompt 1:

Write a code to check if a number is prime or not input by user.

Given Code and Output:

```
lab3.py > ...
1  #Write a code to check if a number is prime or not input by user
2  user_input = int(input("Enter a number to check if it is prime: "))
3  if user_input > 1:
4      for i in range(2, int(user_input**0.5) + 1):
5          if (user_input % i) == 0:
6              print(user_input, "is not a prime number")
7              break
8      else:
9          print(user_input, "is a prime number")
10 else:
11     print(user_input, "is not a prime number")

PROBLEMS    OUTPUT    DEBUG CONSOLE    TERMINAL    PORTS

Enter a number to check if it is prime: 59
59 is a prime number
PS C:\Users\katta\OneDrive\Desktop\AIAC>
```

Prompt 2:

Write a code to check if a number is prime or not input by user using functions.

Given Code and Output:

```
lab3.py > ...
1 #Write a code to check if a number is prime or not input by user using functions
2 def is_prime(num):
3     if num <= 1:
4         return False
5     for i in range(2, int(num**0.5) + 1):
6         if num % i == 0:
7             return False
8     return True
9 user_input = int(input("Enter a number to check if it is prime: "))
10 if is_prime(user_input):
11     print(f"{user_input} is a prime number.")
12 else:
13     print(f"{user_input} is not a prime number.")
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
ktop/AIAC/lab3.py
Enter a number to check if it is prime: 59
59 is a prime number.
PS C:\Users\katta\OneDrive\Desktop\AIAC> & C:/Users/katta/anaconda3/python.exe c:/Users/katta/OneDrive/Desktop/AIAC/lab3.py
Enter a number to check if it is prime: 125
125 is not a prime number.
PS C:\Users\katta\OneDrive\Desktop\AIAC>
```

Prompt 3:

Give an optimized code to check if a number is prime

Given Code and Output:

```
lab3.py > ...
1 #Give an optimized code to check if a number is prime
2 def is_prime(n):
3     if n <= 1:
4         return False
5     if n <= 3:
6         return True
7     if n % 2 == 0 or n % 3 == 0:
8         return False
9     i = 5
10    while i * i <= n:
11        if n % i == 0 or n % (i + 2) == 0:
12            return False
13        i += 6
14    return True
15 number = int(input("Enter a number to check if it is prime: "))
16 if is_prime(number):
17     print(f"{number} is a prime number.")
18 else:
19     print(f"{number} is not a prime number.")
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
Enter a number to check if it is prime: 529
529 is not a prime number.
PS C:\Users\katta\OneDrive\Desktop\AIAC>
```

Task: Mobile Data Usage Billing Application (1.0 Marks)

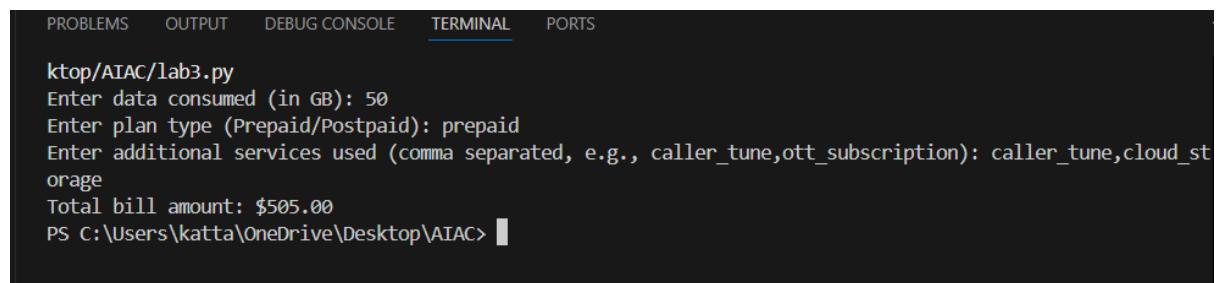
Prompt 1:

Write a code for mobile data usage billing application that takes the input of o Data Consumed (in GB), Plan Type (Prepaid / Postpaid), Additional Services Used (e.g., caller tune, OTT subscription, etc.) and calculate the total bill amount

Code:

```
lab3.py > ...
1   # Write a code for mobile data usage billing application that takes the input of o Data Consumed
2   def calculate_bill(data_consumed_gb, plan_type, additional_services):
3       # Define base rates and additional service costs
4       base_rate_prepaid = 10  # per GB
5       base_rate_postpaid = 8  # per GB
6       additional_service_costs = {
7           'caller_tune': 2,
8           'ott_subscription': 5,
9           'cloud_storage': 3
10      }
11
12      # Calculate base bill based on plan type
13      if plan_type.lower() == 'prepaid':
14          base_bill = data_consumed_gb * base_rate_prepaid
15      elif plan_type.lower() == 'postpaid':
16          base_bill = data_consumed_gb * base_rate_postpaid
17      else:
18          raise ValueError("Invalid plan type. Please choose 'Prepaid' or 'Postpaid'.")
19
20      # Calculate additional services cost
21      additional_cost = sum(additional_service_costs[service] for service in additional_services if
22
23          # Total bill amount
24          total_bill = base_bill + additional_cost
25          return total_bill
26
27      # Example usage
28      data_consumed = float(input("Enter data consumed (in GB): "))
29      plan_type = input("Enter plan type (Prepaid/Postpaid): ")
30      additional_services_input = input("Enter additional services used (comma separated, e.g., caller_tune,ott_subscription): ")
31      additional_services = [service.strip() for service in additional_services_input.split(',') if service]
32      total_amount = calculate_bill(data_consumed, plan_type, additional_services)
33      print(f"Total bill amount: ${total_amount:.2f}")
```

Output:



```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
ktop/AIAC/lab3.py
Enter data consumed (in GB): 50
Enter plan type (Prepaid/Postpaid): prepaid
Enter additional services used (comma separated, e.g., caller_tune,ott_subscription): caller_tune,cloud_storage
Total bill amount: $505.00
PS C:\Users\katta\OneDrive\Desktop\AIAC>
```

Prompt 2:

improve the code by adding Data Charges (based on data usage), Value-added service charges, Tax on total amount, Display an itemized bill.

Code:

```

# improve the code by adding Data Charges (based on data usage), Value-added service charges, Tax on total amount, Display an itemized bill.
def calculate_bill(data_consumed_gb, plan_type, additional_services):
    # Define base rates and additional service costs
    base_rate_prepaid = 10 # per GB
    base_rate_postpaid = 8 # per GB
    additional_service_costs = {
        'caller_tune': 2,
        'ott_subscription': 5,
        'cloud_storage': 3
    }
    tax_rate = 0.1 # 10% tax

    # Calculate base bill based on plan type
    if plan_type.lower() == 'prepaid':
        data_charges = data_consumed_gb * base_rate_prepaid
    elif plan_type.lower() == 'postpaid':
        data_charges = data_consumed_gb * base_rate_postpaid
    else:
        raise ValueError("Invalid plan type. Please choose 'Prepaid' or 'Postpaid'.") 

    # Calculate additional services cost
    additional_cost = sum(additional_service_costs[service] for service in additional_services if service in additional_service_costs)

    # Calculate subtotal
    subtotal = data_charges + additional_cost

    # Calculate tax
    tax_amount = subtotal * tax_rate

    # Total bill amount
    total_bill = subtotal + tax_amount

    # Display itemized bill
    print("\n--- Itemized Bill ---")
    print(f"Data Consumed: {data_consumed_gb} GB")
    print(f"Plan Type: {plan_type.capitalize()}")
    print(f"Data Charges: ${data_charges:.2f}")
    print("Additional Services Used:")
    for service in additional_services:
        if service in additional_service_costs:
            print(f" - {service.replace('_', ' ')}.capitalize(): ${additional_service_costs[service]:.2f}")
    print(f"Subtotal: ${subtotal:.2f}")
    print(f"Tax (10%): ${tax_amount:.2f}")
    print(f"Total Bill Amount: ${total_bill:.2f}")

    return total_bill
# Example usage
data_consumed = float(input("Enter data consumed (in GB): "))
plan_type = input("Enter plan type (Prepaid/Postpaid): ")
additional_services_input = input("Enter additional services used (comma separated, e.g., caller_tune,ott_subscription): ")
additional_services = [service.strip() for service in additional_services_input.split(',') if service.strip()]
total_amount = calculate_bill(data_consumed, plan_type, additional_services)
print(f"\nTotal bill amount: ${total_amount:.2f}")

```

Output:

```

Enter data consumed (in GB): 50
Enter plan type (Prepaid/Postpaid): prepaid
Enter additional services used (comma separated, e.g., caller_tune,ott_subscription): caller_tune, cloud_s
torage

--- Itemized Bill ---
Data Consumed: 50.0 GB
Plan Type: Prepaid
Data Charges: $500.00
Additional Services Used:
 - Caller tune: $2.00
 - Cloud storage: $3.00
Subtotal: $505.00
Tax (10%): $50.50
Total Bill Amount: $555.50

Total bill amount: $555.50
PS C:\Users\katta\OneDrive\Desktop\AIAC>

```

Prompt 3:

Make the above code more optimized and structured

Code:

```

#Make the above code more optimized and structured
def calculate_data_charges(data_consumed_gb, plan_type):
    base_rate_prepaid = 10 # per GB
    base_rate_postpaid = 8 # per GB

    if plan_type.lower() == 'prepaid':
        return data_consumed_gb * base_rate_prepaid
    elif plan_type.lower() == 'postpaid':
        return data_consumed_gb * base_rate_postpaid
    else:
        raise ValueError("Invalid plan type. Please choose 'Prepaid' or 'Postpaid'.")
def calculate_additional_cost(additional_services, additional_service_costs):
    return sum(additional_service_costs[service] for service in additional_services if service in additional_service_costs)
def calculate_tax(subtotal, tax_rate):
    return subtotal * tax_rate
def calculate_bill(data_consumed_gb, plan_type, additional_services):
    additional_service_costs = [
        'caller_tune': 2,
        'ott_subscription': 5,
        'cloud_storage': 3
    ]
    tax_rate = 0.1 # 10% tax

    data_charges = calculate_data_charges(data_consumed_gb, plan_type)
    additional_cost = calculate_additional_cost(additional_services, additional_service_costs)
    subtotal = data_charges + additional_cost
    tax_amount = calculate_tax(subtotal, tax_rate)
    total_bill = subtotal + tax_amount

    # Display itemized bill
    print("\n--- Itemized Bill ---")
    print(f"Data Consumed: {data_consumed_gb} GB")
    print(f"Plan Type: {plan_type.capitalize()}")
    print(f"Data Charges: ${data_charges:.2f}")
    print("Additional Services Used:")
    for service in additional_services:
        if service in additional_service_costs:
            print(f"- {service.replace('_', ' ').capitalize(): ${additional_service_costs[service]:.2f}}")
    print(f"Subtotal: ${subtotal:.2f}")
    print(f"Tax (10%): ${tax_amount:.2f}")
    print(f"Total Bill Amount: ${total_bill:.2f}")

    return total_bill
# Example usage
data_consumed = float(input("Enter data consumed (in GB): "))
plan_type = input("Enter plan type (Prepaid/Postpaid): ")
additional_services_input = input("Enter additional services used (comma separated, e.g., caller_tune,ott_subscription): ")
additional_services = [service.strip() for service in additional_services_input.split(',') if service.strip()]
total_amount = calculate_bill(data_consumed, plan_type, additional_services)
print(f"\nTotal bill amount: ${total_amount:.2f}")

```

Output:

```

Enter data consumed (in GB): 50
Enter plan type (Prepaid/Postpaid): prepaid
Enter additional services used (comma separated, e.g., caller_tune,ott_subscription): caller_tune, cloud_storage

--- Itemized Bill ---
Data Consumed: 50.0 GB
Plan Type: Prepaid
Data Charges: $500.00
Additional Services Used:
- Caller tune: $2.00
- Cloud storage: $3.00
Subtotal: $505.00
Tax (10%): $50.50
Total Bill Amount: $555.50

Total bill amount: $555.50
PS C:\Users\katta\OneDrive\Desktop\AIAC>

```

Task: Develop an LPG Billing System (1.0 Marks)

Prompt 1:

#Write a code to calculate the LPG bill based on cylinder type, number of cylinders booked, subsidy amount, and delivery charges input by user.

Code:

```
lab3.py > ...
1  #Write a code to calculate the LPG bill based on cylinder type, number of cylinders booked, subsidy amount, and delivery charges input by user.
2  def calculate_lpg_bill(cylinder_type, num_cylinders, subsidy_amount, delivery_charges):
3      # Define base prices for different cylinder types
4      base_prices = {
5          'domestic': 500,
6          'commercial': 1000,
7          'industrial': 1500
8      }
9
10     # Get the base price for the selected cylinder type
11     if cylinder_type not in base_prices:
12         raise ValueError("Invalid cylinder type. Choose from 'domestic', 'commercial', or 'industrial'.")
13
14     base_price = base_prices[cylinder_type]
15
16     # Calculate total cost before subsidy and delivery charges
17     total_cost = base_price * num_cylinders
18
19     # Apply subsidy
20     total_cost -= subsidy_amount
21
22     # Add delivery charges
23     total_cost += delivery_charges
24
25     return total_cost
26
27 # Example usage
28 cylinder_type = input("Enter cylinder type (domestic/commercial/industrial): ").strip().lower()
29 num_cylinders = int(input("Enter number of cylinders booked: "))
30 subsidy_amount = float(input("Enter subsidy amount: "))
31 delivery_charges = float(input("Enter delivery charges: "))
32 total_bill = calculate_lpg_bill(cylinder_type, num_cylinders, subsidy_amount, delivery_charges)
33 print(f"The total LPG bill is: {total_bill}")
```

Output:

```
ktop/AIAC/lab3.py
Enter cylinder type (domestic/commercial/industrial): domestic
Enter number of cylinders booked: 3
Enter subsidy amount: 905
Enter delivery charges: 60
The total LPG bill is: 655.0
PS C:\Users\katta\OneDrive\Desktop\AIAC>
```

Explanation:

- In all the tasks at first I asked a basic prompt without any requirements, then the response that was given was very basic.
- After specifying what I wanted in the next prompts the response that was given was more optimised and structured.