**Exercise 4**

**Aim**

To build a Python program that calculates electricity bills for various consumer categories based on units consumed, using control statements.

**Algorithm**

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| --- | --- | --- |
| Step 1 | **:** | Start the Program. |
| Step 2 | **:** | Display the consumer category options |
| Step 3 | **:** | Get user input for the selected consumer category |
| Step 4 | **:** | Validate the user input for category selection |
| Step 5 | **:** | Get input from the user for the number of units consumed. |
| Step 6 | **:** | Validate the number of units |
| Step 7 | **:** | Calculate the total bill based on the consumer category and the number of units consumed using defined rates. |
| Step 8 | **:** | Display the total electricity bill to the user |
| Step 9 | **:** | Stop the Program. |

**Program:**

def calculate\_bill(category, units):

# Define the energy charges based on consumer category and slabs

if category == "Domestic":

if units <= 400:

rate = 4.60

elif units <= 500:

rate = 6.15

elif units <= 600:

rate = 8.15

elif units <= 800:

rate = 9.20

elif units <= 1000:

rate = 10.20

else:

rate = 11.25

elif category == "Industrial":

if units <= 400:

rate = 5.50

elif units <= 500:

rate = 7.00

elif units <= 600:

rate = 8.50

elif units <= 800:

rate = 9.80

elif units <= 1000:

rate = 10.50

else:

rate = 11.75

elif category == "Bulk Supply":

if units <= 400:

rate = 8.15

elif units <= 500:

rate = 9.00

elif units <= 600:

rate = 10.00

elif units <= 800:

rate = 11.00

elif units <= 1000:

rate = 12.00

else:

rate = 13.50

else:

return "Invalid consumer category."

# Calculate the total bill

total\_bill = units \* rate

return total\_bill

# Main loop for user input

while True:

print("Select your consumer category:")

print("1. Domestic")

print("2. Industrial")

print("3. Bulk Supply")

choice = input("Enter the number corresponding to your category (1/2/3): ")

if choice == '1':

category = "Domestic"

elif choice == '2':

category = "Industrial"

elif choice == '3':

category = "Bulk Supply"

else:

print("Invalid choice. Please select again.")

continue

try:

units = float(input("Enter the number of Units consumed: "))

if units < 0:

print("Please enter a non-negative number.")

continue

total\_bill = calculate\_bill(category, units)

if isinstance(total\_bill, str):

print(total\_bill) # Print error message if invalid

else:

print(f"Your total electricity bill: Rs. {total\_bill:.2f}")

except ValueError:

print("Invalid input. Please enter a numeric value for kWh.")

# Option to exit the loop

if input("Do you want to calculate another bill? (yes/no): ").lower() != 'yes':

break

**Output**

**Result:**

Python program to calculate electricity bills based on consumer categories and units consumed has been successfully developed and executed.