

VISUAL BASIC LAB

# Electric Bill

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## Global Power and Electric Company

GPEC delivers power to homes and  
business in your  
community.



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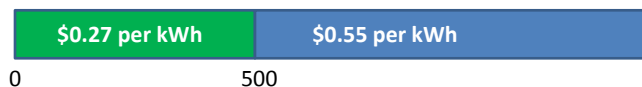
With power conservation and support of low income families in mind, GPEC provides electric power at the baseline rate of only 27 cents per kilo-watt-hour (kWh) for up to 500 kWh before billing at the standard rate of 55 cents per kWh.

A kilo-Watt-hour (kWh) is the equivalent of running a 100 watt light bulb for ten hours or a 1000 watt hair dryer for one hour.

## Your Lab Assignment

Your assignment is to read the number of kWh consumed by a customer in a month and bill at the following rate:

The first 500 kWh are billed at the baseline rate of 27 cents (0.27) per kWh, anything over 500 kWh is billed at 55 cents per kWh (0.55).



Your program must also use Exception Handling (Try...Catch blocks) to handle the case of non-numeric or no input data.

## Compute the Bill

The logic for the Electric Bill program is similar to the logic for the first lab, the Paycheck program.

The differences are

- 1) the only input is the kWh used for the month
- 2) you need to determine the number of kWh less or equal to 500 and the number greater than 500, instead of the number of hours worked less than or equal to 40, and the number of hours worked over 40
- 3) the cost per kWh can be **Constants** and are not input by the user

## 1 - Project Definition

Create a program that does the following:

- 1) Read the number of kWh used by the customer
- 2) compute the Electric Bill with a lower rate for the baseline kWh and a higher rate for kWh over the baseline
- 3) display the Electric Bill

## 2 – Electric Bill – Develop Algorithm

Develop an algorithm in pseudo-code. Use a HIPO (Hierarchical Input Process Output) chart to define the input, process and output for the program.

INPUT	PROCESS	OUTPUT
kWh	Input kWh from user Determine <b>Base_kWh</b> (up to <b>500</b> ) Determine <b>Extra_kWh</b> (over <b>500</b> ) $\text{Base\_Bill} = \text{Base\_kWh} * 0.27$ $\text{Extra\_Bill} = \text{Extra\_kWh} * 0.55$ $\text{Electric\_Bill} = \text{Base\_Bill} + \text{Extra\_Bill}$ Display <b>Electric_Bill</b>	Electric_Bill

Your program must use **Constants** instead of numeric values in the formulas

## 2 – List of Constants and Variables

Define constants for the base\_kWh, the base\_rate and the extra\_rate.

Const base\_kWh As Decimal = 500

Const base\_rate As Decimal = 0.27

Const extra\_rate As Decimal = 0.55

## 2 – List of Constants and Variables

Below are recommendations for the list of variables that you can use in your program. Be careful when you enter the names of the variables. Use capital letters, small letters and underscore ( \_ ) characters to help describe what the variables are used for.

You can select different variable names if you wish, but the names must be descriptive of their use. An **h** for hours is not descriptive.

kWh	Base_Bill
Base_kWh	Extra_Bill
Extra_kWh	Electric_Bill

## 3 – Compute The Electric Bill

Look at the logic for the Paycheck program to see how to separate the bill for the first 500 kWh and the bill for kWh after 500.

Change the logic to get:  
**Base\_kWh** is the number of kWh at or below 500  
**Extra\_kWh** is the number of kWh over 500

Change the logic to compute the:  
**Base\_Bill**, the **Extra\_Bill**, and the **Electric\_Bill**

```
' Compute RegHours and OvertimeHours
If Hours <= 40 Then
    RegHours = Hours           ' all hours are regular
    OvertimeHours = 0         ' no overtime
Else
    RegHours = 40             ' the first 40 hours
    OvertimeHours = Hours - 40 ' anything over 40
End If

' Compute the paycheck
RegPay = RegHours * PayRate
OvertimePay = OvertimeHours * PayRate * 1.5
Paycheck = RegPay + OvertimePay
```

## 4 - Verify the Program Produces These Correct Results

Then use the values for **kWh** shown on your lab assignment for your lab report.

kWh	Computation	Electric_Bill
400	$400 * 0.27$	\$108.00
500	$500 * 0.27$	\$135.00
600	$500 * 0.27$ $+ 100 * 0.55$	\$190.00

Your program must use formulas that only use constant and variable names. Make sure your program can correctly compute the Electric Bill for any value provided for kWh.

## 5 – What Happens When Unexpected Values Are Entered?

The program **MUST** use a **Try...Catch** block to take care of unexpected user inputs. Try entering non-numeric data. Describe what happens in your lab report. Examples:

\$85.39      kWh=93      Eighty-three

## Project Documentation and Lab Report

A text document for the lab report is provided. Some of the lab report for this project is already filled in.

You need to complete the rest of the report that is not filled in.

## Congratulations !

Congratulations on  
writing your own program.

# ACKNOWLEDGEMENTS

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