

## Cell Phone Bill Calculator

### Executive Summary

Three of my siblings and I share a family cell phone plan. Each month I end up logging into T-Mobile's website and calculating out what each person owes. This wouldn't be too bad except that each line has different feature adds and sometimes someone will end up with extra usage charges for texting too much or calling out of the country or something.

To make this monthly process easier I wrote a VBA program that will login to the T-Mobile site and download the most current bill. It then calculates what each individual user owes. Once it has calculated out the bill it gives you the ability to send out an email to each of the users informing them of what they owe for the month.

### Implementation Documentation

The first part of my project was just setting up a page on a spreadsheet to set up the basic form for the user to interact with the program. The first field labeled billing information is where the user must input the user's name, their name as it shows up on the bill, and their email address. I have it set up so there can be up to five users since that is the maximum allowed on a family plan. Currently we only have four people on our plan, but when my parents get back from their mission they will be added to the plan.

The field to the right has three buttons; Download Bill, Calculate Bill, and Email Bill. These buttons do exactly as you would think they would by their names. The field below will display the results of the calculated bill so the user can check to make sure things look correct before they email it out.

| Billing Information |                  |                   |  |
|---------------------|------------------|-------------------|--|
| User                | Name             | Billing Name      | Email  |
| User 1              | Joe Dredge       | Joe               | <a href="mailto:joedredge@gmail.com">joedredge@gmail.com</a>           |
| User 2              | Jeff Dredge      | Jeff              | <a href="mailto:jeffdredge@gmail.com">jeffdredge@gmail.com</a>         |
| User 3              | Devin Dredge     | Devin             | <a href="mailto:ddredge2@gmail.com">ddredge2@gmail.com</a>             |
| User 4              | Shelley Reynolds | Other Line Totals | <a href="mailto:reynoldswindow@gmail.com">reynoldswindow@gmail.com</a> |
| User 5              |                  |                   |  |

Download Bill

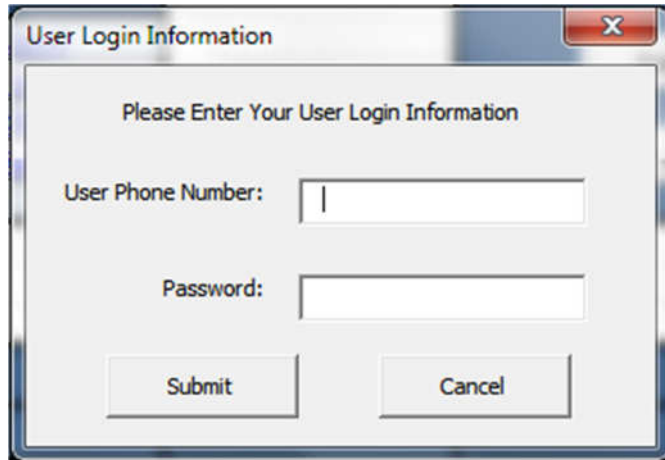
Calculate Bill

Email Bill

| User:             |  |  |  |  |  | Overall Total |
|-------------------|--|--|--|--|--|---------------|
| Base Plan Cost:   |  |  |  |  |  | \$ -          |
| Usage Charges:    |  |  |  |  |  | \$ -          |
| One Time Charges: |  |  |  |  |  | \$ -          |
| Other Charges:    |  |  |  |  |  | \$ -          |
| Taxes & Fees:     |  |  |  |  |  | \$ -          |
| Total:            |  |  |  |  |  | \$ -          |

Actual Total From Bill:

When the user clicks on the Download Bill the following form appears.

A Windows-style dialog box titled "User Login Information" with a close button (X) in the top right corner. The dialog contains the text "Please Enter Your User Login Information". Below this, there are two input fields: "User Phone Number:" followed by a text box with a cursor, and "Password:" followed by a text box. At the bottom, there are two buttons: "Submit" and "Cancel".

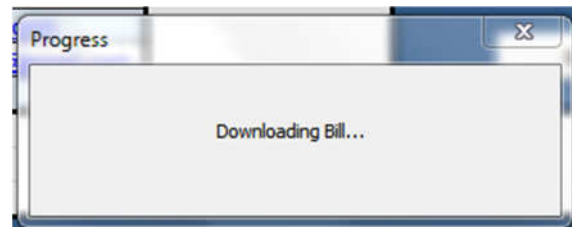
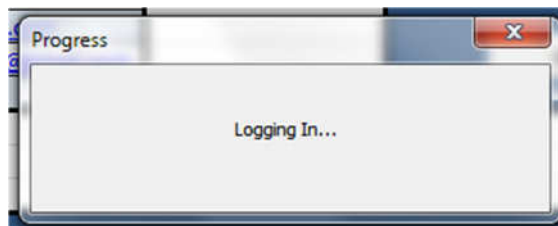
The user must enter their login information for the T-Mobile website and then hit the submit button. After the user hits the submit button the following messages pop up, logging in and the subsequently downloading bill to let the user know that things are working correctly.

Below is a snippet of code that shows the login process.

```
tmo.openpage "https://my.t-mobile.com/Login/MyTMobileLogin.aspx"
tmo.waitForLoad

tmo.explorer.document.all("Login1_txtMSISDN").Value = UserNumber
tmo.explorer.document.all("Login1_txtPassword").Value = UserPassword
tmo.explorer.document.all("Login1_chkRemember").Checked = False
tmo.explorer.document.all("btnLogin").Click
tmo.waitForLoad

tmo.openpage "https://my.t-
mobile.com/PartnerServices.aspx?service=eBill&link=DetailsUsage&unavid=viewbill"
tmo.waitForLoad
```



The actual code pulls up the T-Mobile login website and enters the user's login information provided by the form. It then navigates to the page that displays the bill. Once it is at this page it saves it to the same directory where the workbook is located. It then imports the table that includes the bill information into a new worksheet titled bill. Below is a snapshot of part of the table that was imported from the bill.

|   |           |                  |                  |                  |                    |
|---|-----------|------------------|------------------|------------------|--------------------|
| Account Service Charges:  |           |                  |                  |                  |                    |
| Service charges   | Account   | Joe              | Jeff             | Devin            |                    |
| 10/25/10 - 11/24/10   | 425583924 | See call records | See call records | See call records | Other Line Totals  |
| Expand all Collapse all   |           |                  |                  |                  | Help Tip           |
|   |           |                  |                  |                  | This column displa |
| Monthly charges   | \$89.99   | \$4.99           | \$4.99           | \$9.99           |                    |
| Help Tip  |           |                  |                  |                  |                    |
| Monthly charges   |           |                  |                  |                  |                    |
| These are the basic monthly charges associated with your plan and services (not including other charges, such as taxes and fees).   |           |                  |                  |                  |                    |
| \$9.99 Additional Line  |           |                  |                  | \$9.99           |                    |
| Enhanced Voicemail  |           |                  |                  |                  |                    |
| Msg Value Bundle 300  |           | \$4.99           |                  |                  |                    |
| Msg Value Bundle 400  |           |                  | \$4.99           |                  |                    |
| Promo FavFam M2M 1800   | \$89.99   |                  |                  |                  |                    |
| WorldClass Int'l Rate   |           |                  |                  |                  |                    |
| Use charges   | \$0.00    | \$0.39           | \$0.80           | \$3.00           |                    |
| Help Tip  |           |                  |                  |                  |                    |
| Use charges   |           |                  |                  |                  |                    |
| Use charges include overage, roaming, messaging, and pay per use data charges. On the Pay-Per-Use plan, data is \$1.99/MB. If you switch data plans mid-cycle, for billing, dat |           |                  |                  |                  |                    |
| LOCAL AIRTIME, LONG DISTANCE and INTERNATIONAL CHARGES  |           | \$0.39           |                  |                  |                    |
| MESSAGING CHARGES   |           |                  | \$0.80           | \$3.00           |                    |
| One-time charges  | \$0.00    |                  |                  |                  |                    |
| Help Tip  |           |                  |                  |                  |                    |

I found that the different elements of the bill did not always show up in the same place for each month the bill was downloaded. Because of this to calculate what each person owed I used excel's find function to find the column of each user's billing information and set up a variable. I also set variables for the rows that I needed to calculate the proper billing information. Below is a list of the variables that I set up to perform the calculations.

```
Dim AccountCol As Integer
Dim TotalsCol As Integer
Dim MonthlyChargesRow As Integer
Dim UseChargesRow As Integer
Dim OneTimeChargesRow As Integer
Dim OtherChargesRow As Integer
Dim TaxesFeesRow As Integer
Dim TotalNewChargesRow As Integer
```

```
Dim BasePlanCost As Double
Dim TotalBill As Double
Dim Bill As Double
Dim TaxesFees As Double
Dim BillDate As String
```

```
Dim User1Col As Integer
Dim User1Name As String
Dim User1BillName As String
Dim User1Email As String
Dim User1Bill As Double
Dim User1BasePlan As Double
```

```

Dim User1UseCharges As Double
Dim User1OneTimeCharges As Double
Dim User1OtherCharges As Double

```

For each individual user I run code for each individual user similar to the code before to calculate their individual billing information. It ended up being a little bit of a complicated process to know what each person owed because the way that the bill is displayed for each user and the fact that we get a 15% discount because my brother worked for PWC.

```

User1Name = Worksheets("Billing Info").Cells(6, 4).Value
If User1Name <> "" Then
    User1BillName = Worksheets("Billing Info").Cells(6, 5).Value
    User1Email = Worksheets("Billing Info").Cells(6, 6).Value
    User1Col = Cells.Find(What:=User1BillName, After:=ActiveCell, LookIn:=xlValues,
LookAt:=xlPart, _
        SearchOrder:=xlByRows, SearchDirection:=xlNext, MatchCase:=True, _
        SearchFormat:=False).Column
    User1BasePlan = Application.WorksheetFunction.Round(BasePlanCost / 4 +
Cells(MonthlyChargesRow, User1Col).Value * 0.85, 2)
    User1UseCharges = Application.WorksheetFunction.Round(Cells(UseChargesRow,
User1Col), 2)
    User1OneTimeCharges =
Application.WorksheetFunction.Round(Cells(OneTimeChargesRow, User1Col), 2)
    User1OtherCharges = Application.WorksheetFunction.Round(Cells(OtherChargesRow,
User1Col), 2)
    User1Bill = User1BasePlan + User1UseCharges + User1OneTimeCharges +
User1OtherCharges
    User1Taxes = Application.WorksheetFunction.Round(User1Bill / (Bill - TaxesFees) *
TaxesFees, 2)
    User1Bill = User1Bill + User1Taxes
End If

```

Once the billing information is calculated for each individual user then it is input into the table on the initial page using the following code.

```

If User1Name <> "" Then
    Cells(16, 4) = User1Name
    Cells(17, 4) = User1BasePlan
    Cells(18, 4) = User1UseCharges
    Cells(19, 4) = User1OneTimeCharges
    Cells(20, 4) = User1OtherCharges
    Cells(21, 4) = User1Taxes
    Cells(22, 4) = User1Bill
Else
    Cells(16, 4) = "User 1: NA"
    Cells(17, 4) = ""
    Cells(18, 4) = ""
    Cells(19, 4) = ""

```

```

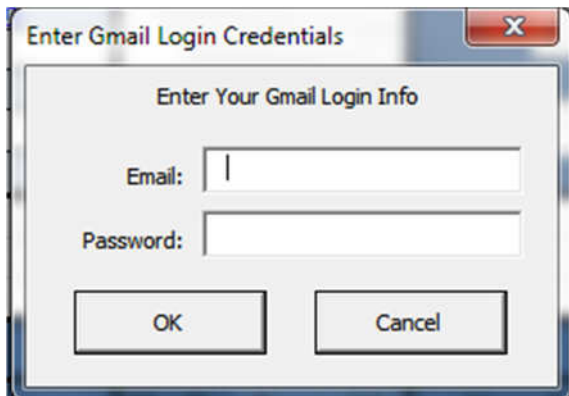
Cells(20, 4) = ""
Cells(21, 4) = ""
Cells(22, 4) = ""
End If

```

At this point the table on the first page looks like the image below. You can see the billing information for each user as well as the total. You can also see the actual total from the bill. In this example the calculated total and the actual total are different by one cent. This is due to rounding error and is not a big deal.

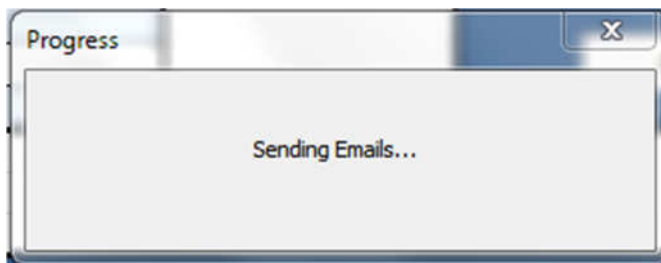
| Cell Phone Bill For 10/25/10 - 11/24/10 |            |             |              |                  |            |                                   |
|---|------------|-------------|--------------|------------------|------------|-----------------------------------|
| User:                                   | Joe Dredge | Jeff Dredge | Devin Dredge | Shelley Reynolds | User 5: NA | Overall Total                     |
| Base Plan Cost:                         | \$ 27.61   | \$ 27.61    | \$ 23.37     | \$ 48.87         |            | \$ 127.46                         |
| Usage Charges:                          | \$ 0.39    | \$ 0.80     | \$ 3.00      | \$ -             |            | \$ 4.19                           |
| One Time Charges:                       | \$ -       | \$ -        | \$ -         | \$ -             |            | \$ -                              |
| Other Charges:                          | \$ 1.41    | \$ 1.41     | \$ 1.41      | \$ 1.41          |            | \$ 5.64                           |
| Taxes & Fees:                           | \$ 3.53    | \$ 3.58     | \$ 3.33      | \$ 6.04          |            | \$ 16.48                          |
| Total:                                  | \$ 32.94   | \$ 33.40    | \$ 31.11     | \$ 56.32         |            | \$ 153.77                         |
|   |            |             |              |                  |            | Actual Total From Bill: \$ 153.76 |

If the billing information looks correct then the user clicks on the Email Bill button and the user form below pops up for the user to input their Gmail login information.



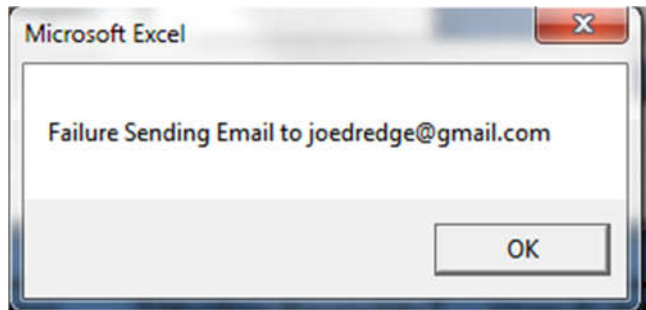
A dialog box titled "Enter Gmail Login Credentials" with a close button (X) in the top right corner. Inside the dialog, there is a label "Enter Your Gmail Login Info". Below this label are two input fields: "Email:" and "Password:". At the bottom of the dialog are two buttons: "OK" and "Cancel".

Once the user hits the OK button the following form pops up letting them know the emails are being sent.

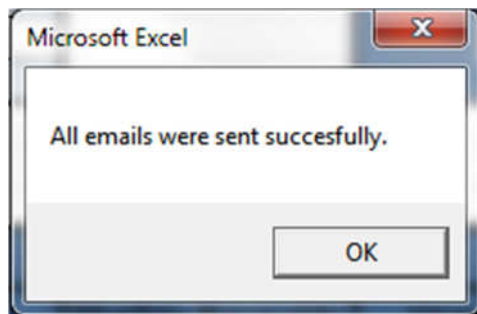


A dialog box titled "Progress" with a close button (X) in the top right corner. Inside the dialog, there is a large rectangular area with the text "Sending Emails..." centered within it.

If there is an error sending an email it will pop up the following information letting the user know there was an issue.



Otherwise it pops up the following message letting the user know everything worked fine.



Below is the code that generated the text of the email and then sends the email using the sendGmail function.

```
For x = 0 To 4
```

```
    If Cells(6 + x, 6).Value <> "" Then
```

```
        subject = Cells(14, 3).Value
```

```
        message = Cells(16, 4 + x).Value & "," & vbNewLine & _  
            "" & vbNewLine & _  
            "Below is your cell phone bill:" & vbNewLine & _  
            "" & vbNewLine & _  
            Cells(17, 3).Value & " $ " & Cells(17, 4 + x).Value & vbNewLine & _  
            Cells(18, 3).Value & " $ " & Cells(18, 4 + x).Value & vbNewLine & _  
            Cells(19, 3).Value & " $ " & Cells(19, 4 + x).Value & vbNewLine & _  
            Cells(20, 3).Value & " $ " & Cells(20, 4 + x).Value & vbNewLine & _  
            Cells(21, 3).Value & " $ " & Cells(21, 4 + x).Value & vbNewLine & _  
            "" & vbNewLine & _  
            Cells(22, 3).Value & " $ " & Cells(22, 4 + x).Value & vbNewLine
```

```
    If sendGMail(EmailLoginInfo.txtUsername, EmailLoginInfo.txtPassword, _  
        message, Cells(6 + x, 6).Value, subject) = False Then  
        MsgBox "Failure Sending Email to " & Cells(6 + x, 6).Value
```

```
        success = False  
    End If
```

```
End If
```

```
Next
```

Below is the actual email that shows up in the user's inbox.

### **Cell Phone Bill For 10/25/10 - 11/24/10**



### **Discussion of Learning and Conceptual Difficulties Encountered**

Developing this program I gained more proficiency with VBA in general. It gave me the chance to solidify a lot of the concepts taught in class such as using user forms, navigating web pages, downloading information from web pages, and sending emails.

The main difficulty I had was initially logging into the T-Mobile webpage. I talked with Professor Allen and he helped me get past this point. Once I got past this point the rest came together without too much difficulty. I was able to google information for any other VBA questions I had.