**VBA Challenge HW2**

Background

In this homework assignment, you will use VBA scripting to analyze generated stock market data.

Objective

The goal of this assignment is to create a VBA script that loops through all the stocks for one year and outputs to new columns, add conditional formatting, and calculate greatest yearly increase, decrease % and volumes and apply these to all worksheets in the workbook/Excel.

Dataset/file:

Module 2 challenge files, Multiple Years Stock Data excel file that has columns in each sheet

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| <ticker> | <date> | <open> | <high> | <low> | <close> | <vol> |

…and file has 3 sheets 2018, 2019, and 2020.

Tasks

1. Create a script that loops through all the stocks for one year and outputs the following information:
   1. The ticker symbol
   2. Yearly change from the opening price at the beginning of a given year to the closing price at the end of that year.
   3. The percentage change from the opening price at the beginning of a given year to the closing price at the end of that year.
   4. The total stock volume of the stock.
2. Add functionality to your script to return the stock with the "Greatest % increase", "Greatest % decrease", and "Greatest total volume".
3. Make the appropriate adjustments to your VBA script to enable it to run on every worksheet (that is, every year) at once.

Deliverables

* Readme
* How to run the code:

To execute this VBA project for analyzing stock market data, follow these steps:

1. Set Up Repository:
   * Create a new repository named "VBA-challenge" for this project.
2. Download Files:
   * Download the necessary files from Module 2 Challenge Files (MultipleYearStockData.xlsx)
3. Open Excel and save as xlsm
   * Enable Developer Tab and If the Developer tab is not already enabled, enable it in Excel.
4. Open the Visual Basic for Applications (VBA) editor by clicking Record Macro (on Mac)
5. Write VBA code
6. Select the macro created (e.g., analyzeStockData) and click Run to execute the script
7. Review results

* Code

1. Create a script that loops through all the stocks for one year and outputs the following information:
   1. The ticker symbol
   2. Yearly change from the opening price at the beginning of a given year to the closing price at the end of that year.
   3. The percentage change from the opening price at the beginning of a given year to the closing price at the end of that year.
   4. The total stock volume of the stock.

StockData1.vba (StockDataAnalysis.vba in alphabetical\_testing 21.xlsm)

Sub StockData1()

Dim ws As Worksheet

Set ws = ThisWorkbook.Sheets("2018") ' Change the sheet name as needed

Dim lastRow As Long

lastRow = ws.Cells(ws.Rows.Count, 1).End(xlUp).Row

Dim ticker As String

Dim openingPrice As Double

Dim closingPrice As Double

Dim yearlyChange As Double

Dim percentageChange As Double

Dim totalVolume As Double

' Set headers for the output columns

ws.Cells(1, 9).Value = "Ticker"

ws.Cells(1, 10).Value = "Yearly Change"

ws.Cells(1, 11).Value = "Percentage Change"

ws.Cells(1, 12).Value = "Total Stock Volume"

Dim summaryRow As Long

summaryRow = 2

For i = 2 To lastRow

If ws.Cells(i - 1, 1).Value <> ws.Cells(i, 1).Value Then

' New ticker symbol

ticker = ws.Cells(i, 1).Value

openingPrice = ws.Cells(i, 3).Value

totalVolume = 0

End If

' Add the volume to the total volume

totalVolume = totalVolume + ws.Cells(i, 7).Value

If ws.Cells(i + 1, 1).Value <> ws.Cells(i, 1).Value Then

' Last row for the ticker symbol

closingPrice = ws.Cells(i, 6).Value

yearlyChange = closingPrice - openingPrice

If openingPrice <> 0 Then

percentageChange = yearlyChange / openingPrice

Else

percentageChange = 0

End If

' Print the results

ws.Cells(summaryRow, 9).Value = ticker

ws.Cells(summaryRow, 10).Value = yearlyChange

'ws.Cells(summaryRow, 11).Value = percentageChange

ws.Cells(summaryRow, 11).Value = Format(percentageChange, "0.00%") ' Format as percentage with 2 decimal places

ws.Cells(summaryRow, 12).Value = totalVolume

' Apply conditional formatting for yearly change

If yearlyChange >= 0 Then

ws.Cells(summaryRow, 10).Interior.ColorIndex = 4 ' Green

Else

ws.Cells(summaryRow, 10).Interior.ColorIndex = 3 ' Red

End If

' Apply conditional formatting for percentage change

If percentageChange >= 0 Then

ws.Cells(summaryRow, 11).Interior.ColorIndex = 4 ' Green

Else

ws.Cells(summaryRow, 11).Interior.ColorIndex = 3 ' Red

End If

' Increment the summary row

summaryRow = summaryRow + 1

End If

Next i

' Autofit columns

ws.Columns("I:L").AutoFit

End Sub

Results with all of AAB and subset of other tickers data when ran on 2018 sheet:

A screenshot of a computer

Description automatically generated

1. Add functionality to your script to return the stock with the "Greatest % increase", "Greatest % decrease", and "Greatest total volume".

StockData2.vba

Sub StockData2()

Dim ws As Worksheet

Set ws = ThisWorkbook.Sheets("2018") ' Change the sheet name as needed

Dim lastRow As Long

lastRow = ws.Cells(ws.Rows.Count, 1).End(xlUp).Row

Dim greatestIncrease As Double

Dim greatestDecrease As Double

Dim greatestVolume As Double

Dim increaseTicker As String

Dim decreaseTicker As String

Dim volumeTicker As String

greatestIncrease = -1

greatestDecrease = 1

greatestVolume = 0

For i = 2 To lastRow

Dim percentageChange As Double

Dim totalVolume As Double

percentageChange = ws.Cells(i, 3).Value

totalVolume = ws.Cells(i, 4).Value

If percentageChange > greatestIncrease Then

greatestIncrease = percentageChange

increaseTicker = ws.Cells(i, 1).Value

End If

If percentageChange < greatestDecrease Then

greatestDecrease = percentageChange

decreaseTicker = ws.Cells(i, 1).Value

End If

If totalVolume > greatestVolume Then

greatestVolume = totalVolume

volumeTicker = ws.Cells(i, 1).Value

End If

Next i

' Write results to new columns

ws.Cells(1, 16).Value = "Ticker"

ws.Cells(1, 17).Value = "Value"

ws.Cells(2, 15).Value = "Greatest % Increase"

ws.Cells(3, 15).Value = "Greatest % Decrease"

ws.Cells(4, 15).Value = "Greatest Total Volume"

ws.Cells(2, 16).Value = increaseTicker

ws.Cells(2, 17).Value = Format(greatestIncrease \* 100, "0.00%")

ws.Cells(3, 16).Value = decreaseTicker

ws.Cells(3, 17).Value = Format(greatestDecrease \* 100, "0.00%")

ws.Cells(4, 16).Value = volumeTicker

ws.Cells(4, 17).Value = Format(greatestVolume, "#,##0")

End Sub

1. Make the appropriate adjustments to your VBA script to enable it to run on every worksheet (that is, every year) at once.

StockData3FinalCode that does all the calculations and new columns and in all sheets.

Sub StockData3FinalCode()

Dim ws As Worksheet

Dim lastRow As Long

Dim ticker As String

Dim openingPrice As Double

Dim closingPrice As Double

Dim yearlyChange As Double

Dim percentageChange As Double

Dim totalVolume As Double

Dim summaryRow As Long

Dim i As Long

Dim greatestIncrease As Double

Dim greatestDecrease As Double

Dim greatestVolume As Double

Dim increaseTicker As String

Dim decreaseTicker As String

Dim volumeTicker As String

For Each ws In ThisWorkbook.Worksheets

If ws.Name <> "Instructions" Then ' Skip the Instructions sheet

lastRow = ws.Cells(ws.Rows.Count, 1).End(xlUp).Row

summaryRow = 2

greatestIncrease = -1

greatestDecrease = 1

greatestVolume = 0

' Set headers for the output columns

ws.Cells(1, 9).Value = "Ticker"

ws.Cells(1, 10).Value = "Yearly Change"

ws.Cells(1, 11).Value = "Percentage Change"

ws.Cells(1, 12).Value = "Total Stock Volume"

For i = 2 To lastRow

If ws.Cells(i - 1, 1).Value <> ws.Cells(i, 1).Value Then

' New ticker symbol

ticker = ws.Cells(i, 1).Value

openingPrice = ws.Cells(i, 3).Value

totalVolume = 0

End If

' Add the volume to the total volume

totalVolume = totalVolume + ws.Cells(i, 7).Value

If ws.Cells(i + 1, 1).Value <> ws.Cells(i, 1).Value Then

' Last row for the ticker symbol

closingPrice = ws.Cells(i, 6).Value

yearlyChange = closingPrice - openingPrice

If openingPrice <> 0 Then

percentageChange = yearlyChange / openingPrice

Else

percentageChange = 0

End If

' Print the results

ws.Cells(summaryRow, 9).Value = ticker

ws.Cells(summaryRow, 10).Value = yearlyChange

ws.Cells(summaryRow, 11).Value = Format(percentageChange, "0.00%")

ws.Cells(summaryRow, 12).Value = totalVolume

' Apply conditional formatting for yearly change

If yearlyChange >= 0 Then

ws.Cells(summaryRow, 10).Interior.ColorIndex = 4 ' Green

Else

ws.Cells(summaryRow, 10).Interior.ColorIndex = 3 ' Red

End If

' Apply conditional formatting for percentage change

If percentageChange >= 0 Then

ws.Cells(summaryRow, 11).Interior.ColorIndex = 4 ' Green

Else

ws.Cells(summaryRow, 11).Interior.ColorIndex = 3 ' Red

End If

' Increment the summary row

summaryRow = summaryRow + 1

End If

' Find greatest % increase, % decrease, and total volume

If percentageChange > greatestIncrease Then

greatestIncrease = percentageChange

increaseTicker = ticker

End If

If percentageChange < greatestDecrease Then

greatestDecrease = percentageChange

decreaseTicker = ticker

End If

If totalVolume > greatestVolume Then

greatestVolume = totalVolume

volumeTicker = ticker

End If

Next i

' Write results to new columns

ws.Cells(1, 16).Value = "Ticker"

ws.Cells(1, 17).Value = "Value"

ws.Cells(2, 15).Value = "Greatest % Increase"

ws.Cells(3, 15).Value = "Greatest % Decrease"

ws.Cells(4, 15).Value = "Greatest Total Volume"

ws.Cells(2, 16).Value = increaseTicker

ws.Cells(2, 17).Value = Format(greatestIncrease \* 100, "0.00%")

ws.Cells(3, 16).Value = decreaseTicker

ws.Cells(3, 17).Value = Format(greatestDecrease \* 100, "0.00%")

ws.Cells(4, 16).Value = volumeTicker

ws.Cells(4, 17).Value = Format(greatestVolume, "#,##0")

End If

Next ws

' Autofit columns for all sheets

For Each ws In ThisWorkbook.Worksheets

ws.Columns("I:L").AutoFit

ws.Columns("O:Q").AutoFit

Next ws

End Sub

Code and results screenshot:

A screenshot of a computer

Description automatically generated

* Solution File

The dataset/solution file for this assignment can be found here.

Multiple\_year\_stock\_data.xlsm

Readme:

References/ Acknowledgements:

Leveraged ChatGPT, Copoilet as/where needed to develop/validate/troubleshoot code/data/functions.

Solution, Recommendations, and Conclusion:

In this VBA assignment, I leveraged VBA scripting to analyze generated stock market data. The objective was to create a script that could loop through all stocks for one year, calculating and outputting various key metrics such as yearly change, percentage change, and total stock volume. Additionally, the VBA script is designed to identify the stocks with the greatest increase, greatest decrease, and greatest total volume.

By completing this assignment, I think, I have demonstrated proficiency in using VBA scripting for data analysis in Excel. I have gained valuable experience in manipulating and analyzing large datasets, as well as in using conditional formatting to highlight specific data points. This assignment has furthered my skills as programmer and Excel expert, bringing me closer to achieving my goal of mastering the tools for data analysis and automation. I really liked the content, lecture, teachings, support, and assignments.