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DU Data Science Bootcamp

Homework #2: VBA Challenge

Due: 6/27/20

Abstract

Please note that only the top section has been screenshot for purposes of this document. To view the full screenshots of the entire data tables created by the VBA script, please review the attached PDFs denoted “2016 Sheet Screenshot”, “2015 Sheet Screenshot”, and “2014 Sheet Screenshot”.

Screenshots of Stock Data VBA Script Results

2016

<ticker>	<date>	<open>	<high>	<low>	<close>	<vol>	Ticker	Yearly Change	Percentage Change	Total Stock Volume			Ticker	Value
A	20160101	41.81	41.81	41.81	41.81	0	A	3.75	8.97%	528576200			Greatest % Increase	SD 11675.00%
A	20160104	41.06	41.19	40.34	40.69	3287300	AA	-1.53	-5.17%	5208239000			Greatest % Decrease	DYN.W -91.49%
A	20160105	40.73	40.95	40.34	40.55	2587200	AAC	-11.82	-62.01%	57179800			Greatest Total Volume	BAC 27428529600
A	20160106	40.24	40.99	40.05	40.73	2103600	AAN	9.6	42.88%	184809000				
A	20160107	40.14	40.15	38.81	39	3504300	AAP	18.61	12.36%	262665300				
A	20160108	39.22	39.71	38.47	38.59	3736700	AAT	4.73	12.33%	49026400				
A	20160111	38.71	38.9	37.41	37.94	2818600	AAV	1.67	32.87%	27358200				
A	20160112	38.43	38.58	37.65	38.19	1989300	AB	-0.4	-1.68%	64736300				
A	20160113	38.35	38.47	36.72	36.86	4206600	ABB	3.34	18.84%	503779400				
A	20160114	36.94	37.88	36.55	37.61	2893300	ABBV	3.38	5.71%	2034231800				
A	20160115	36.67	37.56	36.55	37.11	2994300	ABC	-25.52	-24.61%	647239900				
A	20160118	37.11	37.11	37.11	37.11	0	ABEV	0.45	10.09%	4199335100				
A	20160119	37.64	37.92	36.79	37.2	2506500	ABG	-5.74	-8.51%	89828200				
A	20160120	36.68	37.61	36.13	37.26	2469000	ABM	12.37	43.45%	79787400				
A	20160121	37.35	37.83	36.81	37.23	2298300	ABR	0.31	4.34%	27556100				
A	20160122	37.91	38.18	37.58	37.98	1834400	ABR-A	0.57	2.33%	792500				
A	20160125	37.4	38.03	37.4	37.61	1831200	ABR-B	2.02	8.95%	795300				
A	20160126	37.89	37.96	37.36	37.51	1755000	ABR-C	0.18	0.72%	521300				
A	20160127	37.39	37.92	36.81	37.05	1479400	ABRN	0.7	2.85%	1759800				
A	20160128	37.27	37.27	36.01	36.11	3479400	ABT	-6.5	-14.47%	2298099600				
A	20160129	36.44	37.69	36.31	37.65	2959800	ABX	8.6	116.53%	4996990800				
A	20160201	37.37	37.95	37	37.69	2666500	AC	2.35	7.70%	6530000				
A	20160202	37.18	37.55	36.95	37.07	1742300	ACC	8.43	20.39%	258457600				
A	20160203	37.27	37.36	36.29	37.19	2128400	ACCO	5.92	83.03%	163653100				
A	20160204	37.15	37.79	36.97	37.42	2833400	ACH	1.97	23.91%	11563400				
A	20160205	37.26	37.31	35.83	36.04	4424600	ACM	6.33	21.08%	296759000				
A	20160208	35.61	35.78	34.39	34.8	3888600	ACN	12.63	12.09%	650155300				
A	20160209	34.21	35.77	34.15	35.37	3464400	ACP	2.08	18.33%	21179200				
A	20160210	35.63	36.73	35.53	35.85	3169900	ACRE	2.29	20.02%	35062000				
A	20160211	35.12	35.61	34.94	35.33	3224000	ACV	0.62	3.41%	12734300				
A	20160212	35.84	36.23	35.52	36.22	3923600	ADC	12.06	35.48%	51966400				
A	20160215	36.22	36.22	36.22	36.22	0	ADM	8.97	24.45%	909133500				
A	20160216	36.72	37.17	36.4	37.08	2903600	ADNT	11.6	24.68%	101270800				
A	20160217	35.22	38.13	34.75	37.87	5382300	ADPT	-46.88	-85.99%	181359500				

2015

<ticker>	<date>	<open>	<high>	<low>	<close>	<vol>	Ticker	Yearly Change	Percentage Change	Total Stock Volume			Greatest % Increase	Ticker	Value
A	20150101	40.94	40.94	40.94	40.94	0	A	0.87	2.13%	645319200				PLNT	10000.00%
A	20150102	41.18	41.31	40.37	40.56	1530700	AA	-17.76	-37.49%	6449104200				CBO	-98.59%
A	20150105	40.32	40.46	39.7	39.8	2042200	AA-B	-17.14	-33.97%	40441700				BAC	21277761900
A	20150106	39.81	40.02	39.02	39.18	2084500	AAC	-11.86	-38.36%	78122300					
A	20150107	39.52	39.81	39.29	39.7	3359600	AAN	-8.18	-26.76%	179606700					
A	20150108	40.24	40.98	40.18	40.89	2116300	AAP	-8.77	-5.51%	266930500					
A	20150109	41	41	40.29	40.59	1644900	AAT	-1.46	-3.67%	48158100					
A	20150112	40.61	40.72	39.95	40.11	2771100	AAV	0.29	6.05%	30229400					
A	20150113	40.47	40.7	39.33	39.55	2013400	AB	-1.98	-7.67%	71403800					
A	20150114	39.03	39.1	38.21	39.06	5134000	ABB	-3.42	-16.17%	532805500					
A	20150115	39.33	39.41	37.99	38.01	2630200	ABBV	-6.2	-9.47%	2643021600					
A	20150116	37.86	38.46	37.76	38.25	3003900	ABC	13.55	15.03%	516218400					
A	20150119	38.25	38.25	38.25	38.25	0	ABEV	-1.76	-28.30%	3915345800					
A	20150120	38.43	38.66	37.76	37.93	5033600	ABG	-8.48	-11.17%	82930400					
A	20150121	37.75	38.41	37.68	38.16	2721600	ABM	-0.18	-0.63%	72539400					
A	20150122	38.51	39.86	38.12	39.65	4856500	ABR	0.38	5.61%	37916900					
A	20150123	39.6	39.6	38.76	38.81	1519200	ABR-A	-0.49	-1.96%	1243100					
A	20150126	38.79	39.17	38.47	39.15	1511200	ABR-B	-2.14	-8.66%	1022000					
A	20150127	38.7	39.25	38.58	38.75	1703500	ABR-C	-0.12	-0.47%	634000					
A	20150128	39.01	39.05	37.96	38	2033500	ABRN	0.1	0.41%	2109900					
A	20150129	38	38.47	37.69	38.46	2329900	ABT	-0.11	-0.24%	1469310700					
A	20150130	38.01	38.32	37.71	37.77	3054300	ABX	-3.37	-31.35%	4289215100					
A	20150202	37.9	38.76	37.71	38.69	2508400	AC	1	3.39%	437700					
A	20150203	39.04	39.63	38.92	39.62	2950300	ACC	-0.02	-0.05%	228980000					
A	20150204	39.33	39.46	38.82	39.11	2567400	ACCO	-1.88	-20.87%	167330800					
A	20150205	39.22	39.82	39.22	39.53	1826300	ACH	-3.28	-28.47%	35801000					
A	20150206	39.54	39.81	39.23	39.34	2697200	ACM	-0.34	-1.12%	362299600					
A	20150209	39.23	39.43	38.95	39.04	3586100	ACN	15.19	17.01%	625655000					
A	20150210	39.31	39.76	38.78	39.67	1408700	ACP	-3.76	-24.88%	14348400					
A	20150211	39.64	39.81	39.23	39.33	3337000	ACRE	-0.04	-0.35%	39118800					
A	20150212	39.58	40.06	39.53	40.02	1317700	ACV	-6.79	-27.21%	11539300					
A	20150213	39.97	40.31	39.91	40.15	2211900	ACW	-2.68	-61.75%	46092000					
A	20150216	40.15	40.15	40.15	40.15	0	ADC	2.9	9.33%	27995400					

2014

<ticker>	<date>	<open>	<high>	<low>	<close>	<vol>	Ticker	Yearly Change	Percentage Change	Total Stock Volume			Greatest % Increase	Ticker	Value
A	20140101	57.19	57.19	57.19	57.19	0	A	-16.95	-28.41%	572978100				PLNT	10000.00%
A	20140102	57.1	57.1	56.15	56.21	1916100	AA	15.48	48.54%	5161412000				CBO	-95.73%
A	20140103	56.39	57.35	56.26	56.92	1866600	AA-B	1.34	2.73%	21618200				BAC	21595474700
A	20140106	57.4	57.7	56.56	56.64	1777400	AAC	10.92	54.60%	9789700					
A	20140107	56.95	57.63	56.93	57.45	1463200	AAN	1.17	3.98%	237929300					
A	20140108	57.33	58.54	57.17	58.39	2659400	AAP	48.6	43.91%	200376400					
A	20140109	58.4	58.68	57.87	58.41	1757600	AAT	8.38	26.66%	40207800					
A	20140110	58.51	59.01	58.14	58.93	1623300	AAV	0.45	10.37%	86658700					
A	20140113	58.77	59.1	58.6	58.93	2946700	AB	4.49	21.04%	83051600					
A	20140114	59.16	59.95	59.02	59.88	2562200	ABB	-5.41	-20.37%	466820000					
A	20140115	59.82	60.37	59.59	60.34	2335100	ABBV	12.63	23.92%	2303237600					
A	20140116	60.24	60.5	60.04	60.5	1835900	ABC	19.85	28.23%	428969000					
A	20140117	60.83	60.83	60.33	60.71	1699500	ABEV	-1.13	-15.37%	3208014300					
A	20140120	60.71	60.71	60.71	60.71	0	ABG	22.18	41.27%	81065600					
A	20140121	60.69	60.88	59.86	60.85	3008400	ABM	0.06	0.21%	52403000					
A	20140122	60.82	61.22	60.71	60.93	2769300	ABR	0.11	1.65%	28348400					
A	20140123	60.48	60.51	59.4	59.47	3063500	ABR-A	0.77	3.18%	1798500					
A	20140124	59.46	59.46	57.71	57.87	2656300	ABR-B	2.09	9.24%	1722000					
A	20140127	57.9	58.37	56.98	58.3	4669000	ABR-C	0.94	3.86%	1758200					
A	20140128	58.5	58.88	57.91	58.1	2536200	ABRN	0.49	2.04%	3451100					
A	20140129	57.67	58.22	57.41	57.65	2163000	ABT	6.69	17.45%	1516024700					
A	20140130	58.42	60.11	58.42	59.51	3743100	ABX	-6.88	-39.02%	3085372400					
A	20140131	58.61	59.15	58.05	58.15	3529000	ACC	9.15	28.41%	180543400					
A	20140203	58.15	58.48	56.08	56.15	2929200	ACCO	2.29	34.08%	223248000					
A	20140204	56.32	57.88	56.09	57.81	2911800	ACH	2.82	32.41%	34117500					
A	20140205	57.58	57.7	56.96	57.43	2283800	ACM	0.94	3.19%	303393900					
A	20140206	57.51	58.35	57.46	58.29	1609400	ACN	7.09	8.62%	705479100					
A	20140207	58.46	59.47	58.13	59.42	1975200	ACP	-2.47	-14.05%	14206700					
A	20140210	59.27	59.44	58.29	59.01	1760400	ACRE	-1.62	-12.37%	44197000					
A	20140211	59	60	58.88	59.73	2148200	ACW	0.61	16.35%	60360500					
A	20140212	60	60.46	59.67	59.89	2347200	ADC	2.07	7.13%	16456400					
A	20140213	59.45	60.38	59.37	60.08	3097000	ADM	8.6	19.82%	899905700					
A	20140214	57.15	57.77	54.87	55.25	17862700	ADPT	12.24	48.65%	14777500					

VBA Script

Please note that this VBA script has been attached in two separate files in two different file types (just in case).

```
Sub MasterSolution_VBA_Homework_DSC()

Dim ws As Worksheet
' iterate through all worksheets
For Each ws In ActiveWorkbook.Worksheets
ws.Activate

' GENERAL SECTION
' Variables
Dim last_row As Long
Dim ticker As String
Dim ticker_index As Integer
Dim header_index As Integer
Dim open_price As Double
Dim close_price As Double
Dim yearly_change As Double
Dim percent_change As Double
Dim total_volume As Double
Dim GPI_value As Double
Dim GPI_ticker As String
Dim GPD_value As Double
Dim GPD_ticker As String
Dim GTV_value As Double
Dim GTV_ticker As String

last_row = Cells(Rows.Count, 1).End(xlUp).Row
ticker_index = 0
header_index = 2
total_volume = 0

' determine open price on first day and close price on last day in year

' summarize data by ticker
' ***PLEASE READ: The Homework says to compute the values as of beginning of year and end
of year, meaning first day (20160101) and last day (20161230)
For I = 2 To last_row
' designate first day of year
If Right(Str(Cells(I, 2).Value), 4) = "0101" Then
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```

        open_price = Cells(l, 3).Value
        ticker = Cells(l, 1).Value
    End If
' designate last day of year
    If Right(Str(Cells(l, 2).Value), 4) = "1231" Then
        close_price = Cells(l, 6).Value
        ticker = Cells(l, 1).Value
    ElseIf Right(Str(Cells(l, 2).Value), 4) = "1230" Then
        close_price = Cells(l, 6).Value
        ticker = Cells(l, 1).Value
    End If
' compute total volume per ticker
    total_volume = total_volume + Cells(l, 7)
' compute yearly change per ticker
    If ticker <> Cells(l + 1, 1).Value Then
        yearly_change = close_price - open_price
' computer percentage change
    If open_price <> 0 Then
        percent_change = yearly_change / open_price
    Else
        percent_change = 100
End If

' input tickers, yearly change, percentage change, and total stock volume
    Range("I" & header_index).Value = ticker
    Range("J" & header_index).Value = yearly_change
    Range("K" & header_index).Value = percent_change
    Range("L" & header_index).Value = total_volume

' formatting

' negative values are red
    If yearly_change < 0 Then
        Range("J" & header_index).Interior.ColorIndex = 3
' zero values and positive values are green
    Else
        Range("J" & header_index).Interior.ColorIndex = 4
    End If

' format percentage change as percent
    Range("K:K").NumberFormat = "0.00%"
    Cells(2, 17).NumberFormat = "0.00%"
    Cells(3, 17).NumberFormat = "0.00%"

```

```

' add headers
Range("I1").Value = "Ticker"
Range("J1").Value = "Yearly Change"
Range("K1").Value = "Percentage Change"
Range("L1").Value = "Total Stock Volume"

' move header_index to the next row
header_index = header_index + 1

' reset the open_price and ticker
open_price = Cells(I + 1, 3).Value
ticker = Cells(I + 1, 1).Value
total_volume = 0

End If
Next I

' CHALLENGES SECTION
' stats table, far right

' set table headers
Cells(2, 15).Value = "Greatest % Increase"
Cells(3, 15).Value = "Greatest % Decrease"
Cells(4, 15).Value = "Greatest Total Volume"
Cells(1, 16).Value = "Ticker"
Cells(1, 17).Value = "Value"

' input ticker and value for Greatest % Increase (GPI)
GPI_value = WorksheetFunction.Max(Columns("K"))
Cells(2, 17).Value = GPI_value
For I = 2 To last_row
    For j = 9 To 12
        If Cells(I, j) = GPI_value Then
            GPI_ticker = Cells(I, 9)
        End If
    Next j
Next I
Cells(2, 16).Value = GPI_ticker

' input ticker and value for Greatest % Decrease (GPD)
GPD_value = WorksheetFunction.Min(Columns("K"))
Cells(3, 17).Value = GPD_value
For I = 2 To last_row
    For j = 9 To 12

```

```
        If Cells(I, j) = GPD_value Then
            GPD_ticker = Cells(I, 9)
        End If
    Next j
Next I
Cells(3, 16).Value = GPD_ticker

' input ticker and value for Greatest Total Volume (GTV)
GTV_value = WorksheetFunction.Max(Columns("L"))
Cells(4, 17).Value = GTV_value
For I = 2 To last_row
    For j = 9 To 12
        If Cells(I, j) = GTV_value Then
            GTV_ticker = Cells(I, 9)
        End If
    Next j
Next I
Cells(4, 16).Value = GTV_ticker

' auto fit data to cells
Columns("I:Q").AutoFit

Next ws
End Sub
```