**Assignment 5**

**Class: OM 424-01-22413**

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**Overview of the assignment:**

This assignment aims to expand the business analytics system developed in Assignments 1, 2, 3, and 4. The main objective of Assignment 5 is forecasting, visualization, and optimization. There are 3 main tasks, first is forecasting and optimization by developing forecasting models for demand, production cost, and holding for the next 3 months and also creating an optimization model. Along with that, we need to create mini dashboards by creating line charts for each demand, inventory, and production unit for the next 3 months. Lastly, create a report that automatically generates the results' pdf report.

**How the assignment was implemented:**

Understanding and preparation:

We reviewed the assignment provided and identified the steps we needed to start it. We changed the date format to month-year and changed the heading title for all the columns. Then we went through the assignment description and took notes on the steps we would need to follow. We also saved the new file PPP 5 as an XLSM file.

**1,2,3, and 4 subroutines:**

 We started by creating a subroutine called "GeneratePlan," which calls the module 1 forecast function. Next, we call the module 4 "findoptimization1" subroutine, which is used to optimize the schedule. Additionally, we developed a second subroutine that uses module 1's "createinventorylinechart" function to produce a line chart showing the inventory levels. For the production demand trends, we next do an additional subroutine. After that, a subroutine from module 2 that generates a report is created, compiling the data and formatting it into a PDF document.

Sub GeneratePlan()

    'This calls the forecat subroutine in module 1

    Call FormatMonth

    'This calls the OptimizeSchedule subroutine in Module 4

    Call findoptimization1

End Sub

Sub CreateInventory()

    'This calls the InventoryLineChart subroutine from module 1

    Call CreateInventoryLineChart

End Sub

Sub CreateProductiondemandlinechart()

    'This calls the Productiondemandlinechart subroutine from module 1

    Call CreateDemand\_ProductionLineChart

End Sub

Sub GeneratePDF()

    'This calls the createPDF subroutine from module 2

    Call GenerateReport

End Sub

**5th subroutine:**

This function takes a specified range of data from the data worksheet and uses it to construct a line chart. It then makes a new chart called "3moproductionunitanddemand" based on the selected data.It looks to see if a sheet with the same name already exists before producing the new chart; if it does, it deletes it and makes sure a new chart is created. After that, it uses data to automatically create a new line chart showing production units and demand over a three-month period.

Sub

Create3monthProductionUnitandDemandLineChart()

'

' Create3moProductionUnitandDemandLineChartMoMacro

'

'

' -- Dim and Set

    Dim ws\_data As Worksheet

    Dim last\_row As Integer

    Set ws\_data = Sheets("Data")

' -- defining the last\_row

    last\_row = ws\_data.Range("A" & ws\_data.Rows.Count).End(xlUp).Row

' -- delete the 3moProductionUnitandDemand chart sheet if it exists

    For Each ws In Sheets

        If ws.Name = "3monthProductionUnitandDemand" Then

            Application.DisplayAlerts = False

            Sheets("3moProductionUnitandDemand").Delete

            Application.DisplayAlerts = True

        End If

    Next

    ws\_data.Activate

    'Range("A1:A" & last\_row).Select

    Range("A53:A55").Select

    ActiveWindow.SmallScroll Down:=-16

    Range("A53:A" & last\_row & ",F53:F" & last\_row).Select

    Range("F1").Activate

    ActiveSheet.Shapes.AddChart2(332, xlLineMarkers).Select

    ActiveChart.SetSourceData Source:=Range("Data!$A$53:$A$" & last\_row & ",Data!$B$53:$B$" & last\_row & ",Data!$F$53:$F$" & last\_row)

    ActiveChart.Location Where:=xlLocationAsNewSheet, Name:="3moProductionUnitandDemand"

End Sub

**6th subroutine:**

Using the production cost and holding cost information obtained from the "data" worksheet, we generate a line chart on the new sheet called "3moproductioncostandholdingcost" in this subroutine. The last row of data in column A of the worksheet is then found, the data range is chosen, a line chart is added for the selected data, and the chart's location is ultimately assigned to a new sheet. Last but not least, a new chart will not be created if the sheet with the name "3monthproductioncostandholdingcost" already exists.

Sub Create3moProductionCostandHoldingCostLineChart()

'

' CreateProductionCostandHoldingCostLineChartMoMacro

'

'

' -- Dim and Set

    Dim ws\_data As Worksheet

    Dim last\_row As Integer

    Set ws\_data = Sheets("Data")

' -- defining the last\_row

    last\_row = ws\_data.Range("A" & ws\_data.Rows.Count).End(xlUp).Row

' -- delete the 3moProductionCostandHoldingCost chart sheet if it exists

    For Each ws In Sheets

        If ws.Name = "3monthProductionCostandHoldingCost" Then

            Application.DisplayAlerts = False

            Sheets("3moProductionCostandHoldingCost").Delete

            Application.DisplayAlerts = True

        End If

    Next

    ws\_data.Activate

    'Range("A1:A" & last\_row).Select

    Range("A53:A" & last\_row & ",D53:D" & last\_row).Select

    Range("D53").Activate

    ActiveSheet.Shapes.AddChart2(332, xlLineMarkers).Select

    ActiveChart.SetSourceData Source:=Range("Data!$A$53:$A$" & last\_row & ",Data!$C$53:$C$" & last\_row & ",Data!$D$53:$D$" & last\_row)

    ActiveChart.Location Where:=xlLocationAsNewSheet, Name:="3moProductionCostandHoldingCost"

End Sub

**7th subroutine:**

This subroutine uses the inventory information from the "data" worksheet to build a new line chart with the name "3monthinventory." It searches for the final row of data in column A of the "data worksheet," chooses the data range, creates a line chart to illustrate the data, and designates a new sheet as the chart's destination. Before making a new sheet, it will erase any existing ones with the same name.

Sub

Create3monthLineChart() for the inventory' CreateInventoryLineChart3MoMacro

'

'

' -- Dim and Set

    Dim ws\_data As Worksheet

    Dim last\_row As Integer

    Set ws\_data = Sheets("Data")

' -- defining the last\_row

    last\_row = ws\_data.Range("A" & ws\_data.Rows.Count).End(xlUp).Row

' -- delete the inventory chart sheet if it exists

    For Each ws In Sheets

        If ws.Name = "3monthInventory" Then

            Application.DisplayAlerts = False

            Sheets("3monthInventory").Delete

            Application.DisplayAlerts = True

        End If

    Next

    ws\_data.Activate

    'Range("A53:A" & last\_row).Select

    Range("A53:A" & last\_row & ",G53:G" & last\_row).Select

    Range("G53").Activate

    ActiveSheet.Shapes.AddChart2(332, xlLineMarkers).Select

    ActiveChart.SetSourceData Source:=Range("Data!$A$53:$A$" & last\_row & ",Data!$G$53:$G$" & last\_row)

    ActiveChart.Location Where:=xlLocationAsNewSheet, Name:="3monthInventory"

**8th subroutine:**

This subroutine uses the demand data information from the "data" worksheet to build a new line chart with the name "3monthdemand." It searches for the final row of data in column A of the "data worksheet," chooses the data range, creates a line chart to illustrate the data, and designates a new sheet as the chart's destination. Before making a new sheet, it will erase any existing ones with the same name. Finally, it will create a line chart for the demand data.

Range("A1:A" & last\_row & ",B1:B" & last\_row).Select

Range("B1").Activate

ActiveSheet.Shapes.AddChart2(332, xlLineMarkers).Select

ActiveChart.SetSourceData Source:=Range("Data!$A$1:$A$" & last\_row & ",Data!$B$1:$B$" & last\_row)

ActiveChart.Location Where:=xlLocationAsNewSheet, Name:="demand"

**9th subroutine:**

This subroutine uses the demand data information for the projected demand from the "data" worksheet to build a new line chart with the name "demand." It searches for the final row of data in column A of the "data worksheet," chooses the data range, creates a line chart to illustrate the data, and designates a new sheet as the chart's destination. Before making a new sheet, it will erase any existing ones with the same name. Finally, it will create a line chart for the demand data for the 3 month projected data.

Range("A1:A" & last\_row & ",B1:B" & last\_row).Select

Range("B1").Activate

ActiveSheet.Shapes.AddChart2(332, xlLineMarkers).Select

ActiveChart.SetSourceData Source:=Range("Data!$A$1:$A$" & last\_row & ",Data!$B$1:$B$" & last\_row)

ActiveChart.Location Where:=xlLocationAsNewSheet, Name:="demand"

**10th subroutine:**

Lastly, this subroutine creates a button for forecast demand as we record the macro and create a button and assign each macro for it to each chart. So,when the user clicks on the specific button, the chart according to the button opens up.

ActiveWindow.SmallScroll ToRight:=1

ActiveSheet.ChartObjects("Chart 1").Activate

ActiveChart.PlotArea.Select

ActiveChart.ChartArea.Select

ActiveChart.Parent.Cut

Sheets("Demand").Select

Range("I12").Select

ActiveSheet.Paste

ActiveSheet.ChartObjects("Chart 1").Activate

ActiveSheet.ChartObjects("Chart 1").Activate

**A short tutorial on how to use the .xlsm file.**

**A screenshot of a blue and white screen

Description automatically generated**

**VBA: Appendix**

1. **Sub** GeneratePlan()
2. 'This calls the forecat subroutine in module 1
3. **Call** FormatMonth
4. 'This calls the OptimizeSchedule subroutine in Module 4
5. **Call** findoptimization1
6. **End** **Sub**
7. **Sub** CreateInventory()
8. 'This calls the InventoryLineChart subroutine from module 1
9. **Call** CreateInventoryLineChart
11. **End** **Sub**
12. **Sub** CreateProductiondemandlinechart()
13. 'This calls the Productiondemandlinechart subroutine from module 1
14. **Call** CreateDemand\_ProductionLineChart
15. **End** **Sub**
16. **Sub** GeneratePDF()
17. 'This calls the createPDF subroutine from module 2
18. **Call** GenerateReport
20. **End** **Sub**
21. **Sub** Create3monthProductionUnitandDemandLineChart()
22. '
23. ' Create3moProductionUnitandDemandLineChartMoMacro
24. '
26. '
27. ' -- Dim and Set
28. **Dim** ws\_data **As** Worksheet
29. **Dim** last\_row **As** **Integer**
31. **Set** ws\_data = Sheets("Data")
33. ' -- defining the last\_row
34. last\_row = ws\_data.Range("A" & ws\_data.Rows.Count).**End**(xlUp).Row
36. ' -- delete the 3moProductionUnitandDemand chart sheet if it exists
37. **For** **Each** ws **In** Sheets
38. **If** ws.Name = "3monthProductionUnitandDemand" **Then**
39. Application.DisplayAlerts = **False**
40. Sheets("3moProductionUnitandDemand").Delete
41. Application.DisplayAlerts = **True**
42. **End** **If**
43. **Next**
45. ws\_data.Activate
47. 'Range("A1:A" & last\_row).Select
49. Range("A53:A55").**Select**
50. ActiveWindow.SmallScroll Down:=-16
51. Range("A53:A" & last\_row & ",F53:F" & last\_row).**Select**
52. Range("F1").Activate
53. ActiveSheet.Shapes.AddChart2(332, xlLineMarkers).**Select**
54. ActiveChart.SetSourceData Source:=Range("Data!$A$53:$A$" & last\_row & ",Data!$B$53:$B$" & last\_row & ",Data!$F$53:$F$" & last\_row)
55. ActiveChart.Location Where:=xlLocationAsNewSheet, Name:="3moProductionUnitandDemand"
56. **End** **Sub**
58. **Sub** Create3moProductionCostandHoldingCostLineChart()
59. '
60. ' CreateProductionCostandHoldingCostLineChartMoMacro
61. '
63. '
64. ' -- Dim and Set
65. **Dim** ws\_data **As** Worksheet
66. **Dim** last\_row **As** **Integer**
68. **Set** ws\_data = Sheets("Data")
70. ' -- defining the last\_row
71. last\_row = ws\_data.Range("A" & ws\_data.Rows.Count).**End**(xlUp).Row
73. ' -- delete the 3moProductionCostandHoldingCost chart sheet if it exists
74. **For** **Each** ws **In** Sheets
75. **If** ws.Name = "3monthProductionCostandHoldingCost" **Then**
76. Application.DisplayAlerts = **False**
77. Sheets("3moProductionCostandHoldingCost").Delete
78. Application.DisplayAlerts = **True**
79. **End** **If**
80. **Next**
82. ws\_data.Activate
84. 'Range("A1:A" & last\_row).Select
86. Range("A53:A" & last\_row & ",D53:D" & last\_row).**Select**
87. Range("D53").Activate
88. ActiveSheet.Shapes.AddChart2(332, xlLineMarkers).**Select**
89. ActiveChart.SetSourceData Source:=Range("Data!$A$53:$A$" & last\_row & ",Data!$C$53:$C$" & last\_row & ",Data!$D$53:$D$" & last\_row)
90. ActiveChart.Location Where:=xlLocationAsNewSheet, Name:="3moProductionCostandHoldingCost"
91. **End** **Sub**
93. **Sub** Create3monthInventoryLineChart()
94. '
95. ' CreateInventoryLineChart3MoMacro
96. '
98. '
99. ' -- Dim and Set
100. **Dim** ws\_data **As** Worksheet
101. **Dim** last\_row **As** **Integer**
103. **Set** ws\_data = Sheets("Data")
105. ' -- defining the last\_row
106. last\_row = ws\_data.Range("A" & ws\_data.Rows.Count).**End**(xlUp).Row
108. ' -- delete the inventory chart sheet if it exists
109. **For** **Each** ws **In** Sheets
110. **If** ws.Name = "3monthInventory" **Then**
111. Application.DisplayAlerts = **False**
112. Sheets("3monthInventory").Delete
113. Application.DisplayAlerts = **True**
114. **End** **If**
115. **Next**
117. ws\_data.Activate
119. 'Range("A53:A" & last\_row).Select
121. Range("A53:A" & last\_row & ",G53:G" & last\_row).**Select**
122. Range("G53").Activate
123. ActiveSheet.Shapes.AddChart2(332, xlLineMarkers).**Select**
124. ActiveChart.SetSourceData Source:=Range("Data!$A$53:$A$" & last\_row & ",Data!$G$53:$G$" & last\_row)
125. ActiveChart.Location Where:=xlLocationAsNewSheet, Name:="3monthInventory"
126. **End** **Sub**
127. **Sub** CreateDemandLineChart()
128. '
129. ' CreateDemandLineChartMacro
130. '
132. '
133. ' -- Dim and Set
134. **Dim** ws\_data **As** Worksheet
135. **Dim** last\_row **As** **Integer**
137. **Set** ws\_data = Sheets("Data")
139. ' -- defining the last\_row
140. last\_row = ws\_data.Range("A" & ws\_data.Rows.Count).**End**(xlUp).Row
142. ' -- delete the demand chart sheet if it exists
143. **For** **Each** ws **In** Sheets
144. **If** ws.Name = "demand" **Then**
145. Application.DisplayAlerts = **False**
146. Sheets("demand").Delete
147. Application.DisplayAlerts = **True**
148. **End** **If**
149. **Next**
151. ws\_data.Activate
153. 'Range("A1:A" & last\_row).Select
155. Range("A1:A" & last\_row & ",B1:B" & last\_row).**Select**
156. Range("B1").Activate
157. ActiveSheet.Shapes.AddChart2(332, xlLineMarkers).**Select**
158. ActiveChart.SetSourceData Source:=Range("Data!$A$1:$A$" & last\_row & ",Data!$B$1:$B$" & last\_row)
159. ActiveChart.Location Where:=xlLocationAsNewSheet, Name:="demand"
160. **End** **Sub**
161. **Sub** Create3monthDemandLineChart()
162. '
163. ' CreateDemand3MoLineChartMacro
164. '
166. '
167. ' -- Dim and Set
168. **Dim** ws\_data **As** Worksheet
169. **Dim** last\_row **As** **Integer**
171. **Set** ws\_data = Sheets("Data")
173. ' -- defining the last\_row
174. last\_row = ws\_data.Range("A" & ws\_data.Rows.Count).**End**(xlUp).Row
176. ' -- delete the demand 3Mo chart sheet if it exists
177. **For** **Each** ws **In** Sheets
178. **If** ws.Name = "3monthdemand" **Then**
179. Application.DisplayAlerts = **False**
180. Sheets("3monthdemand").Delete
181. Application.DisplayAlerts = **True**
182. **End** **If**
183. **Next**
185. ws\_data.Activate
187. 'Range("A1:A" & last\_row).Select
189. Range("A3:A" & last\_row & ",B53:B" & last\_row).**Select**
190. Range("B53").Activate
191. ActiveSheet.Shapes.AddChart2(332, xlLineMarkers).**Select**
192. ActiveChart.SetSourceData Source:=Range("Data!$A$53:$A$" & last\_row & ",Data!$B$53:$B$" & last\_row)
193. ActiveChart.Location Where:=xlLocationAsNewSheet, Name:="3monthdemand"
194. **End** **Sub**
195. **Sub** buttonforecastdemand()
196. '
197. ' buttonforecastdemand Macro
198. '
200. '
201. ActiveWindow.SmallScroll ToRight:=1
202. ActiveSheet.ChartObjects("Chart 1").Activate
203. ActiveChart.PlotArea.**Select**
204. ActiveChart.ChartArea.**Select**
205. ActiveChart.Parent.Cut
206. Sheets("Demand").**Select**
207. Range("I12").**Select**
208. ActiveSheet.Paste
209. ActiveSheet.ChartObjects("Chart 1").Activate
210. ActiveSheet.ChartObjects("Chart 1").Activate
211. **End** **Sub**

Citation

When searching how to copy VBA code with highlights (syntax highlighter) Reference:  
Caluori, N. (n.d.). Syntax Highlighter for Word - K26. https://syntax- highlighter.k26.ch/#