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Assignment 5

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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"
```

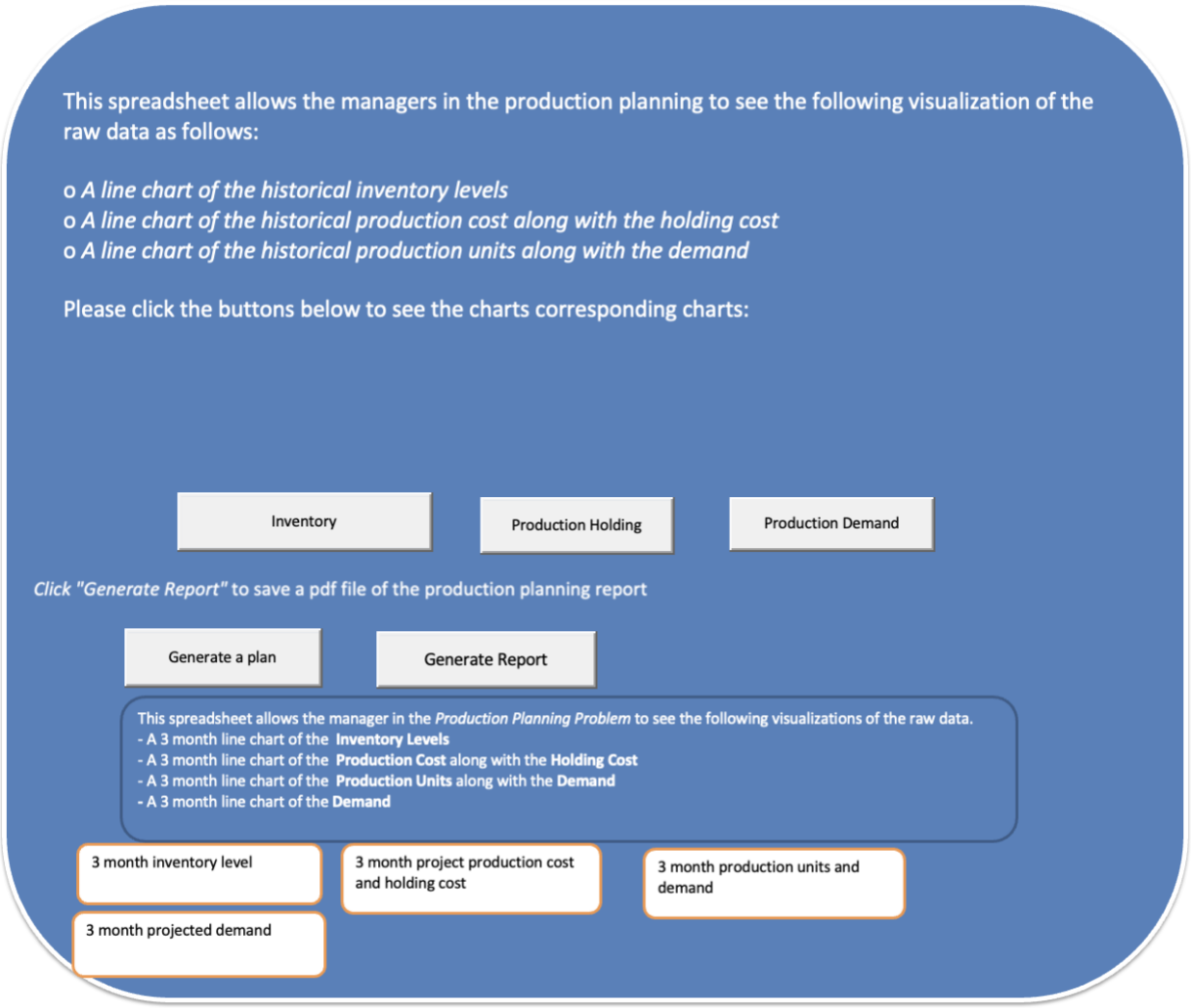
10th subroutine:

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.



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
```

```
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
    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
```

```
54.          ActiveChart.SetSourceData Source:=Range("Data!$A$53:$A$" & last_row
   & ",Data!$B$53:$B$" & last_row & ",Data!$F$53:$F$" & last_row)
55.          ActiveChart.Location                    Where:=xlLocationAsNewSheet,
   Name:="3moProductionUnitandDemand"
56.      End Sub
57.
58.      Sub Create3moProductionCostandHoldingCostLineChart()
59.      '
60.      ' CreateProductionCostandHoldingCostLineChartMoMacro
61.      '
62.
63.      '
64.      ' -- Dim and Set
65.          Dim ws_data As Worksheet
66.          Dim last_row As Integer
67.
68.          Set ws_data = Sheets("Data")
69.
70.      ' -- defining the last_row
71.          last_row = ws_data.Range("A" & ws_data.Rows.Count).End(xlUp).Row
72.
73.      ' -- delete the 3moProductionCostandHoldingCost chart sheet if it exists
74.          For Each ws In Sheets
75.              If ws.Name = "3monthProductionCostandHoldingCost" Then
76.                  Application.DisplayAlerts = False
77.                  Sheets("3moProductionCostandHoldingCost").Delete
78.                  Application.DisplayAlerts = True
79.              End If
80.          Next
81.
82.          ws_data.Activate
83.
84.          'Range("A1:A" & last_row).Select
85.
86.          Range("A53:A" & last_row & ",D53:D" & last_row).Select
87.          Range("D53").Activate
88.          ActiveSheet.Shapes.AddChart2(332, xlLineMarkers).Select
89.          ActiveChart.SetSourceData Source:=Range("Data!$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
92.
93.      Sub Create3monthInventoryLineChart()
94.      '
95.      ' CreateInventoryLineChart3MoMacro
96.      '
97.
```

```
98.      '
99.      ' -- Dim and Set
100.        Dim ws_data As Worksheet
101.        Dim last_row As Integer
102.
103.        Set ws_data = Sheets("Data")
104.
105.     ' -- defining the last_row
106.        last_row = ws_data.Range("A" & ws_data.Rows.Count).End(xlUp).Row
107.
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
116.
117.        ws_data.Activate
118.
119.        'Range("A53:A" & last_row).Select
120.
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.    '
131.
132.    '
133.    ' -- Dim and Set
134.        Dim ws_data As Worksheet
135.        Dim last_row As Integer
136.
137.        Set ws_data = Sheets("Data")
138.
139.    ' -- defining the last_row
140.        last_row = ws_data.Range("A" & ws_data.Rows.Count).End(xlUp).Row
141.
142.    ' -- delete the demand chart sheet if it exists
```

```
        For Each ws In Sheets
            If ws.Name = "demand" Then
                Application.DisplayAlerts = False
                Sheets("demand").Delete
                Application.DisplayAlerts = True
            End If
        Next

        ws_data.Activate

        'Range("A1:A" & last_row).Select

        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"
    End Sub
    Sub Create3monthDemandLineChart()
    '
    ' CreateDemand3MoLineChartMacro
    '


    '
    ' -- 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 demand 3Mo chart sheet if it exists
        For Each ws In Sheets
            If ws.Name = "3monthdemand" Then
                Application.DisplayAlerts = False
                Sheets("3monthdemand").Delete
                Application.DisplayAlerts = True
            End If
        Next

        ws_data.Activate

        '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.     '
199.
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/#