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DATA ANALYTICS

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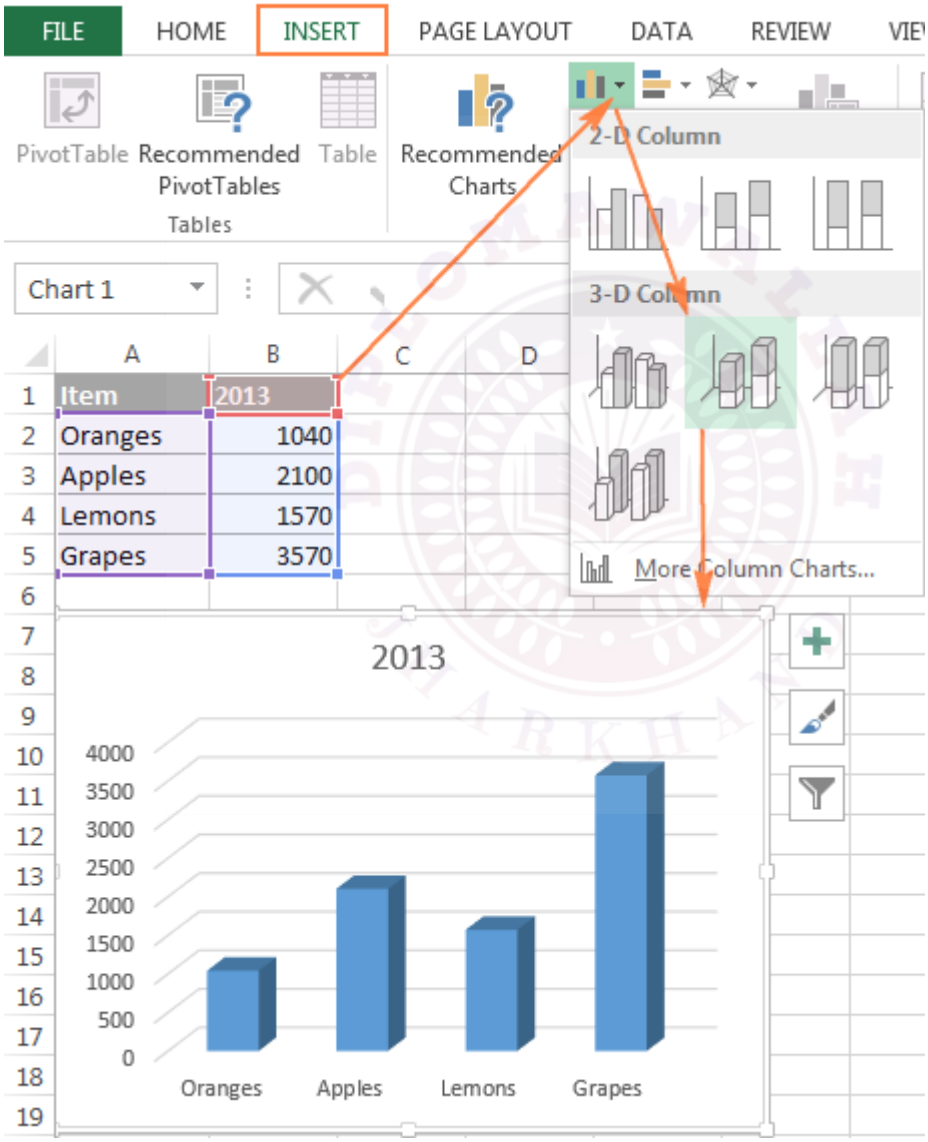
Jharkhand University Of Technology (JUT)

Unit IV: Data Visualization

4.1 Creating a Simple Chart • Charting Non-Adjacent Cells



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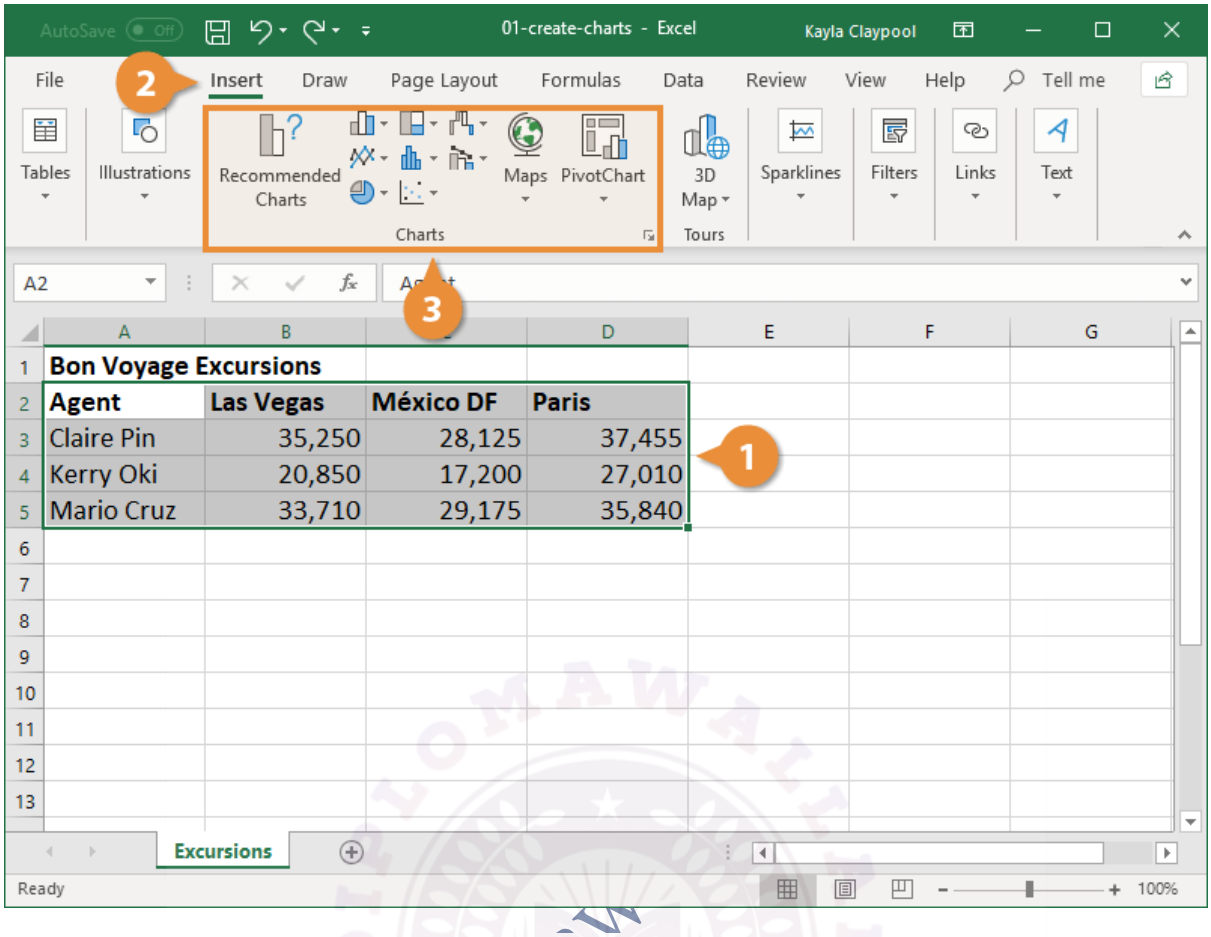

Purchase Orders

PO #	Oper	Description	Supplier	Ordered	Invoiced	Receipted	Ret
26436	MJ	carton additive	THOMAS S	144			
26438	MJ	ink for May	MANNERS	291.53			
26439	PA	Air Release Label	DALTONS	3415.27			
26440	MJ	Engineering	ATTWOODS	2525.89	1936.77	1956.96	
26442	MJ	F1 belting 120mm	GGC LTD	609.94			
26444	PA	Eatlight pockets	STEVENS	196.87	234.1	196.87	
26445	MJ	Methylated Spirits	CCI(NZ)	457.38	457.38	457.38	
26450	MJ	3/4" BS Chain	SGB LTD	300.15	300.15	300.15	
26451	MJ	Waste and water	WATER IS US	6537	6537	6537	
26453	DJ	Freight	FREIGHT 4 U	21.9	21.9	21.9	
26454	DP	plant hire	HIRE PLANTS	60.94	60.94	60.94	
26455	DP	frame by frame	FRAMERS	1217.25	1217.25	1217.25	
26456	MJ	Aluminium Rod 20mm	BENNETS	91.91	91.91	91.91	

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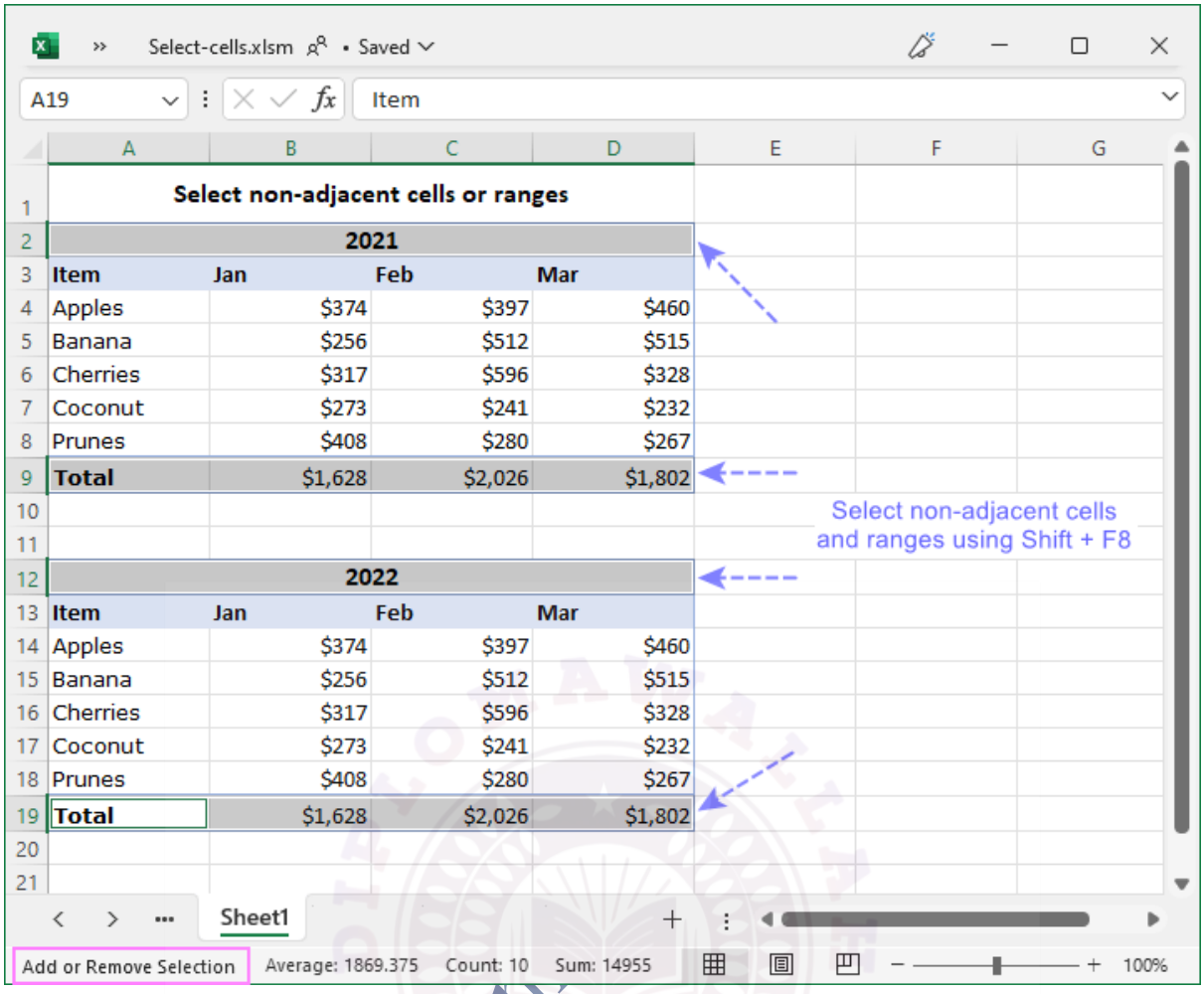

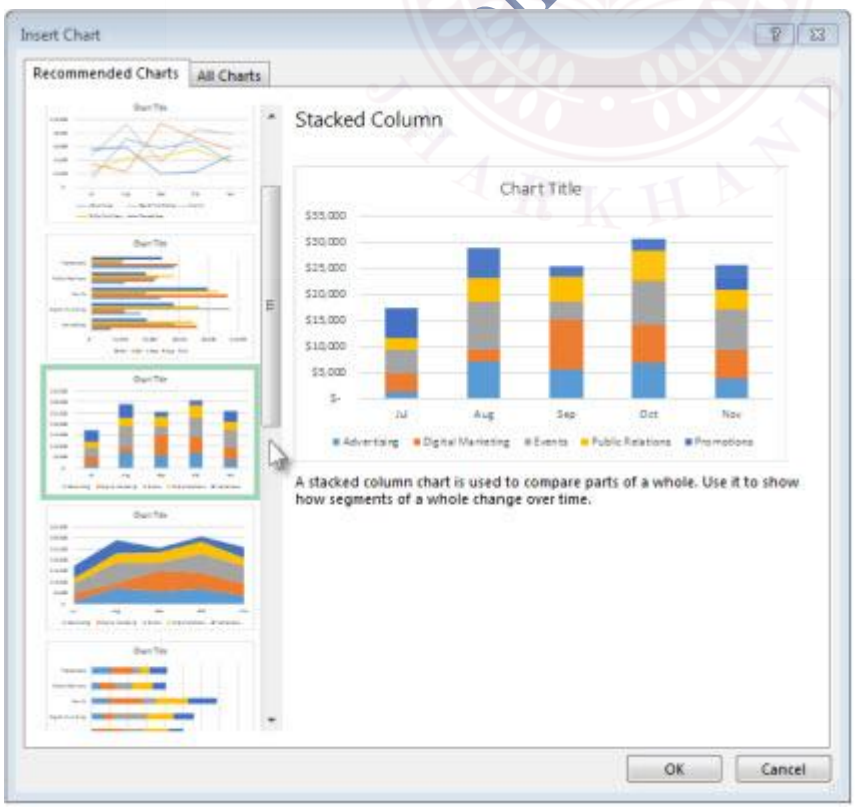

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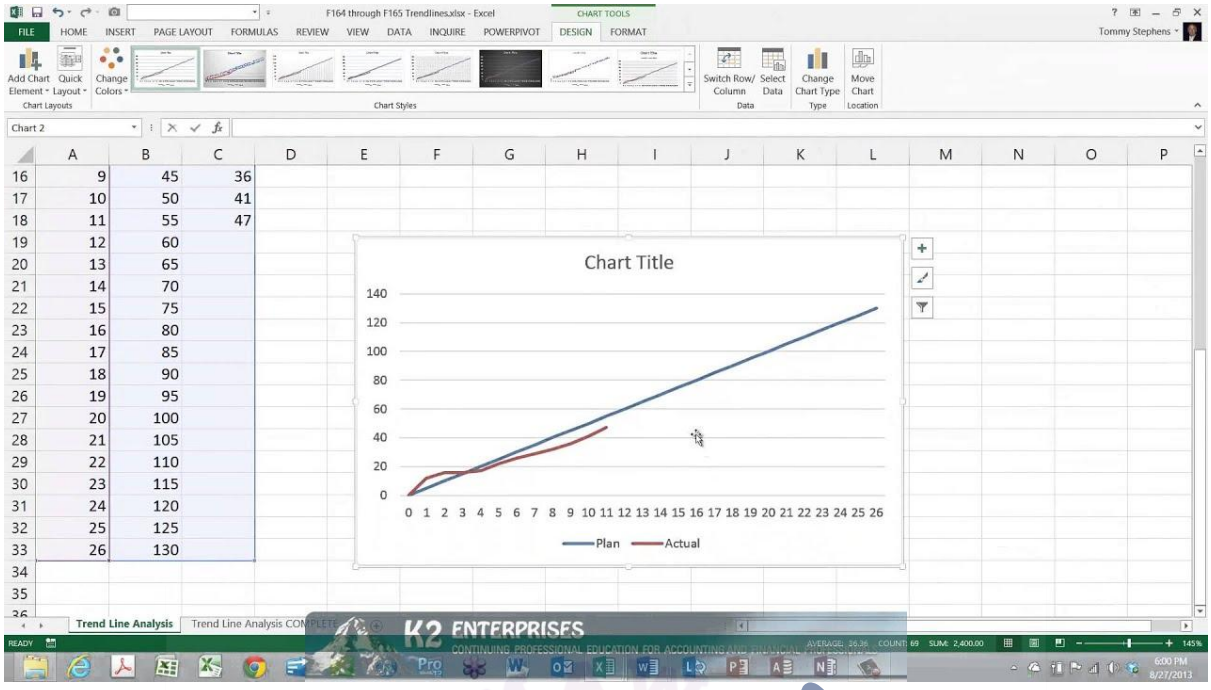

What it is:

- A "simple chart" refers to creating a basic chart (bar, column, line, area, etc) from your data in Excel to visually present trends, comparisons or distributions.
- "Charting non-adjacent cells" means that you can select data that is not in one contiguous block (for example two separate ranges) and still build a chart that includes both.

Why it matters (theory):

- Visual representation helps make data insights clearer — instead of tables, charts enable pattern spotting, comparisons and highlight differences.
- In many exam questions you may be given a dataset and asked to *create a chart* or *select the correct cells for a chart*. Knowing how to handle non-adjacent cell selection is useful because raw data is often not perfectly contiguous.
- Understanding chart creation fundamentals is foundational to more advanced visualization tasks (formatting, types, embedding, pie charts) covered later.

How to do / key steps:

1. Ensure your data is properly laid out: each column has a header, values below.
2. Highlight the data to include: for adjacent data, simply select the full contiguous range. For non-adjacent cells, you can hold Ctrl and select additional ranges you want to include.

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3. Go to Insert → Charts (or Recommended Charts) → choose a chart type. According to Microsoft:

"Select data for the chart … Insert > Recommended Charts. Select a chart on the Recommended Charts tab … OK." (Microsoft Support)

4. Once inserted, you can move/resize the chart (see later sections).
5. Check that the axes, data series, labels correctly reflect your selections.

Exam-style answer tips:

- Write a precise definition: "A simple chart in Excel visualises numeric data using shapes like bars or lines to make patterns visible."
- Describe "non-adjacent selection" and how to select non-contiguous ranges (Ctrl + select).
- Example sentence: "If I want to chart total sales in Jan and total sales in Mar (skipping Feb), I hold Ctrl, select Jan column and March column, then Insert → Column Chart."
- When discussing in exam, mention data layout (headers, contiguous vs non), mention correct use of Insert tab.

Important theory note:
Selecting non-adjacent cells can sometimes result in unintended series or axis labels. Ensure that you clearly define each series and that your chart's legend correctly reflects the data: mis-selection can cause misleading charts. Also, remember that charting non-adjacent ranges may prevent you from using some automatic features like "Switch Row/Column" cleanly.

4.2 Creating a Chart Using the Chart Wizard • Modifying Charts • Moving an Embedded Chart • Sizing an Embedded Chart

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Excel Chart Wizard

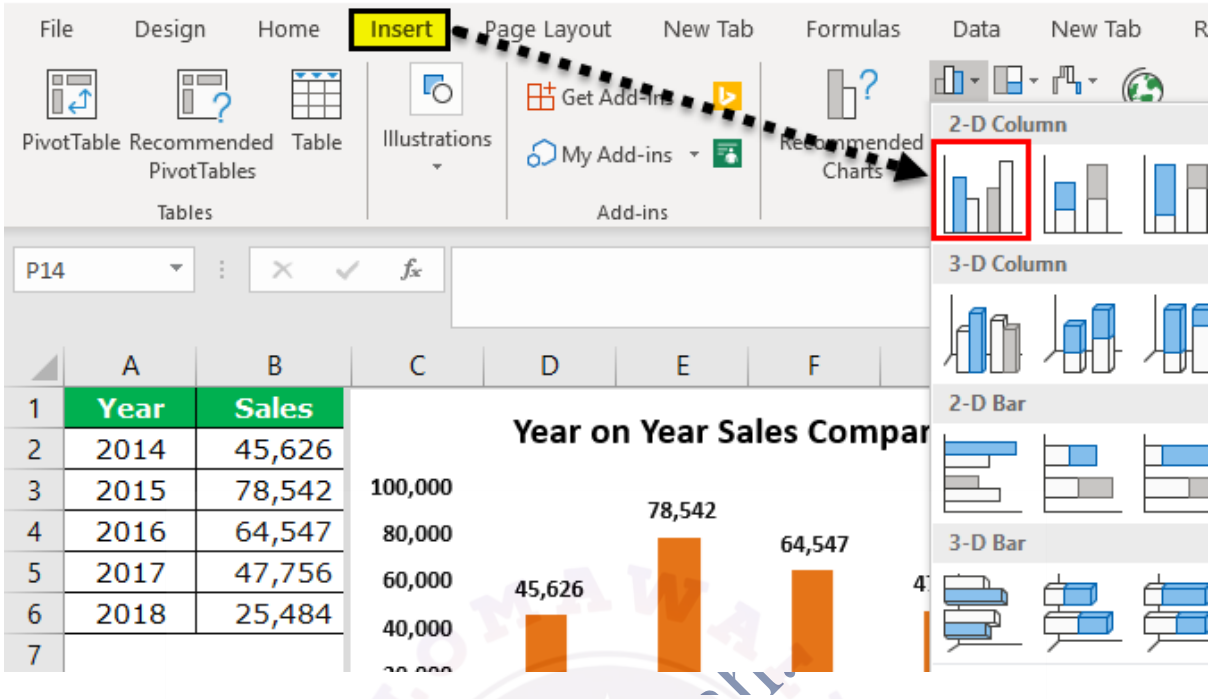
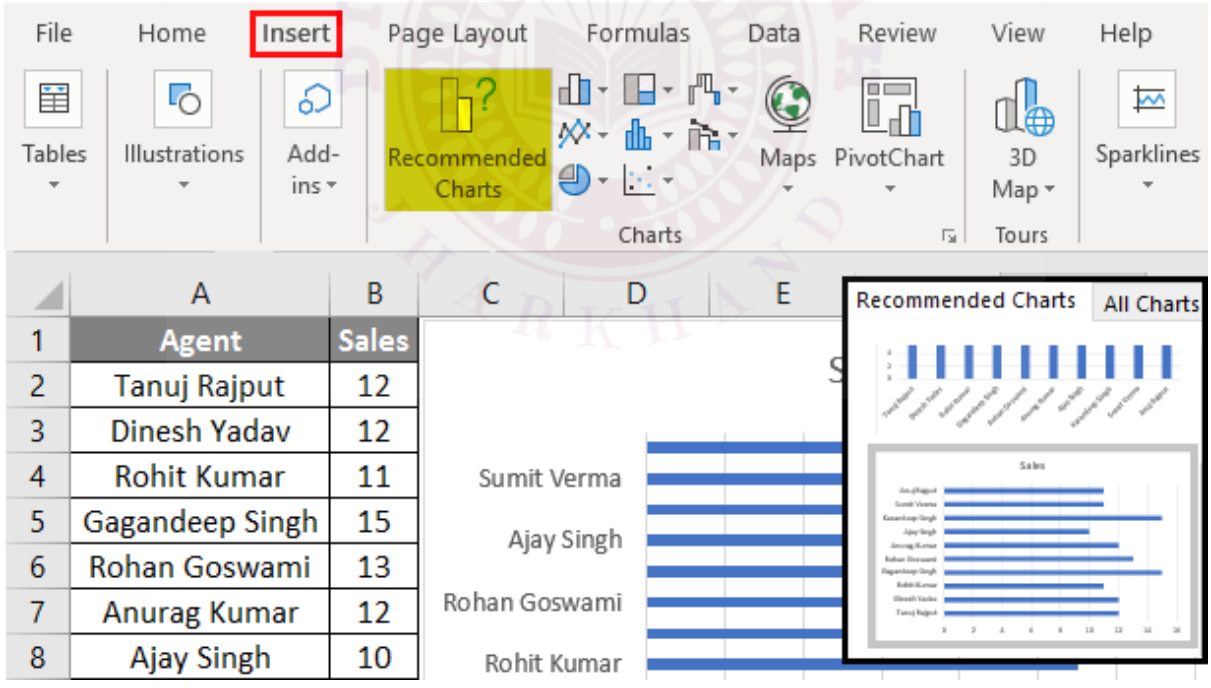


Chart Wizard in Excel



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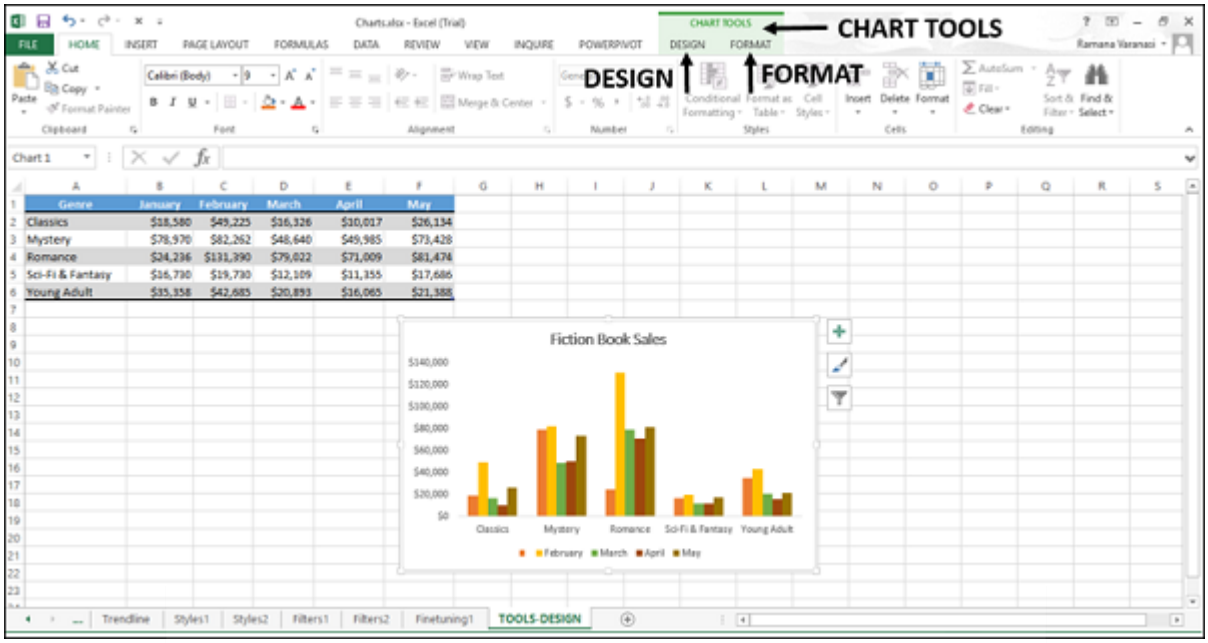

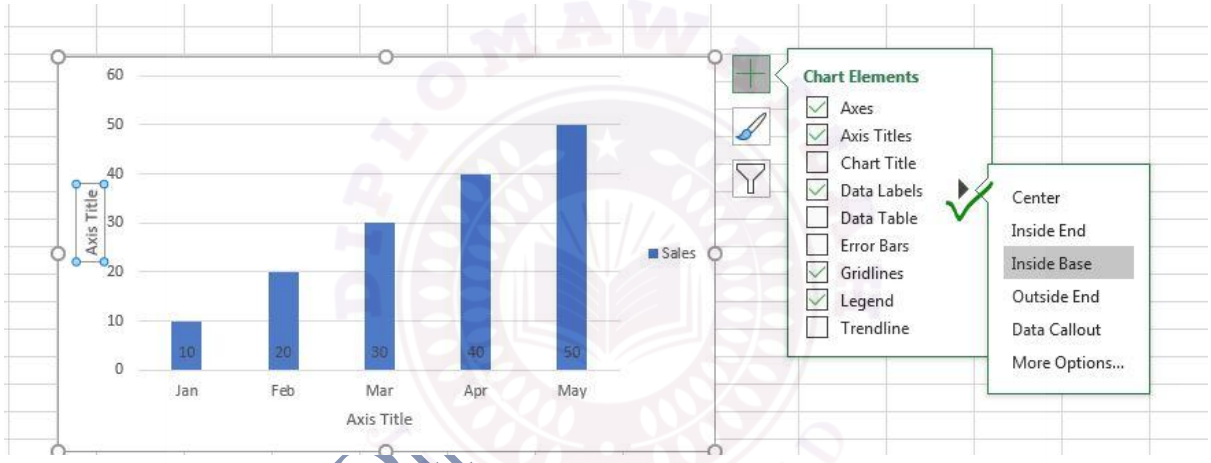

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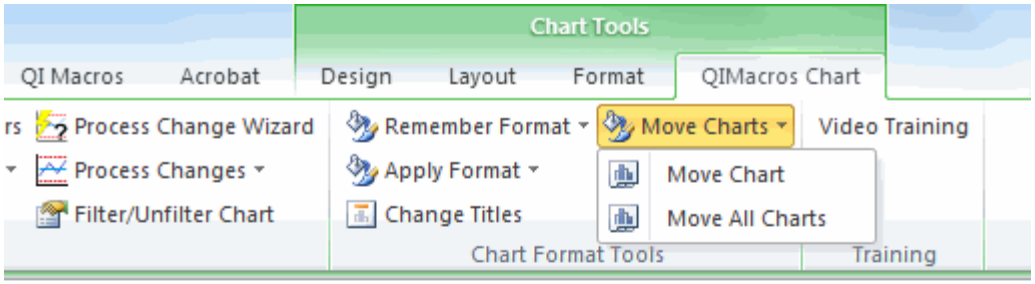

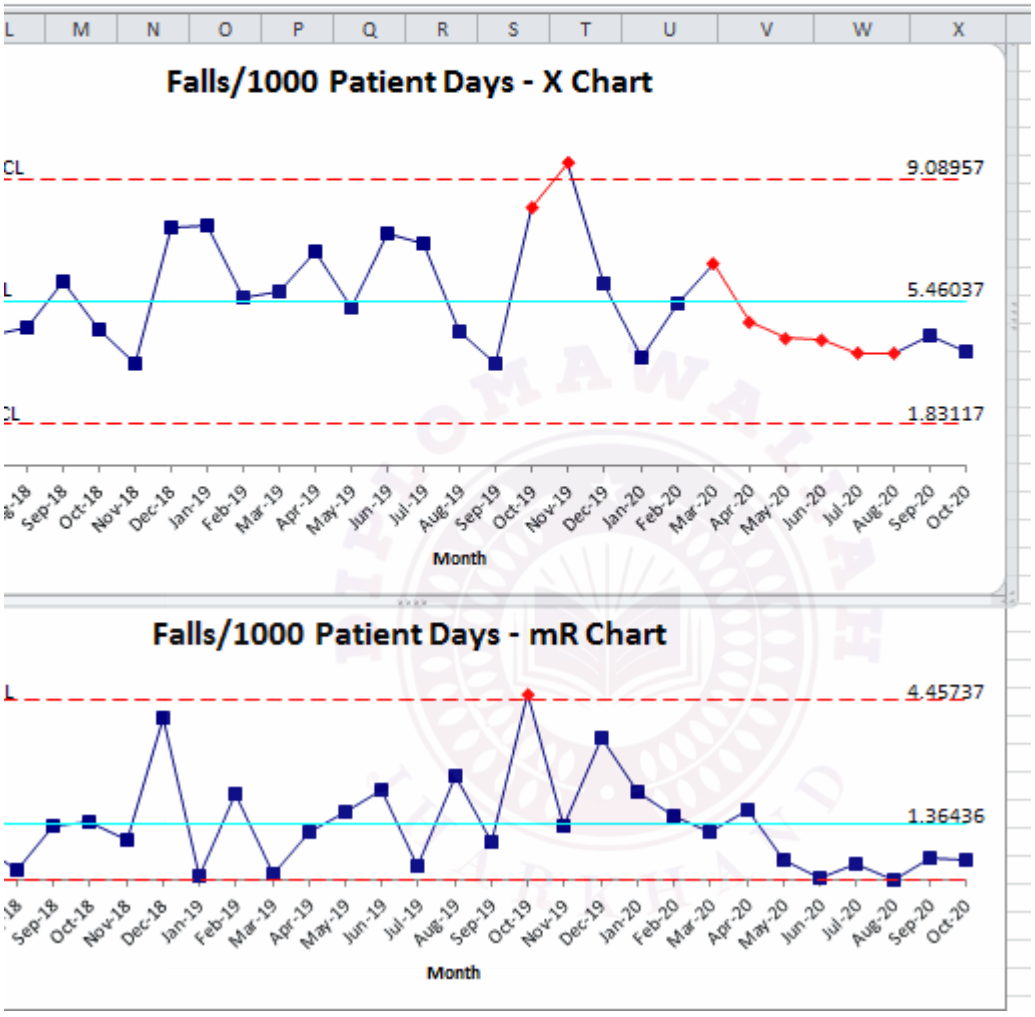

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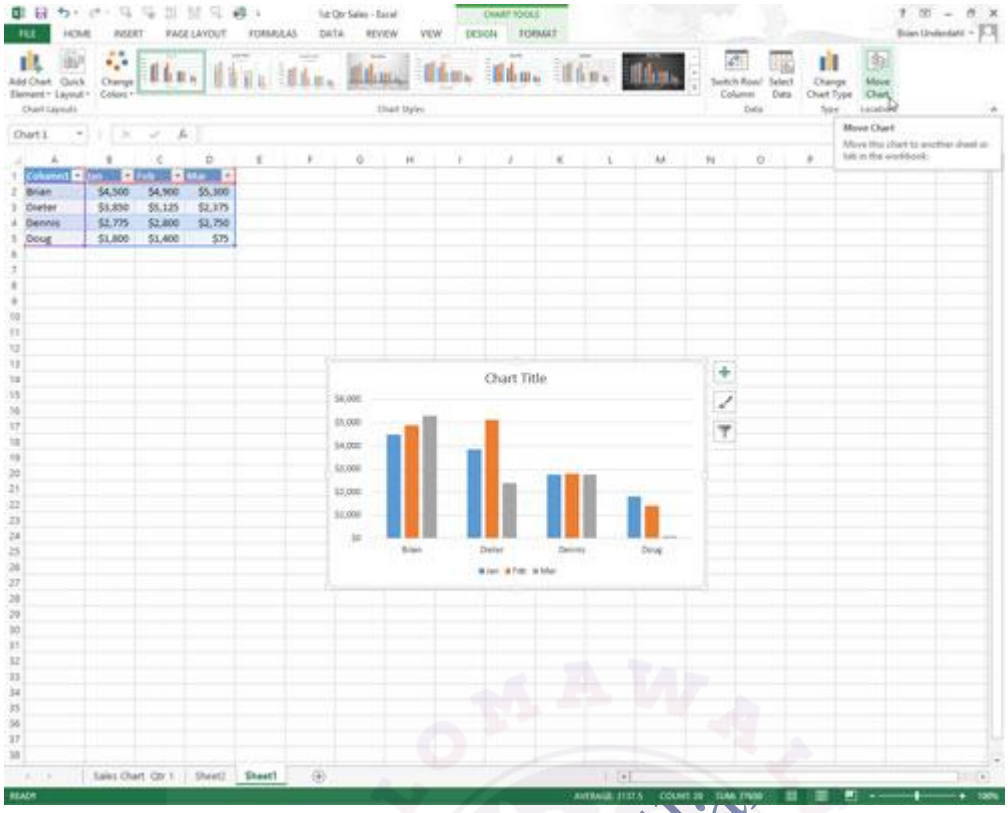

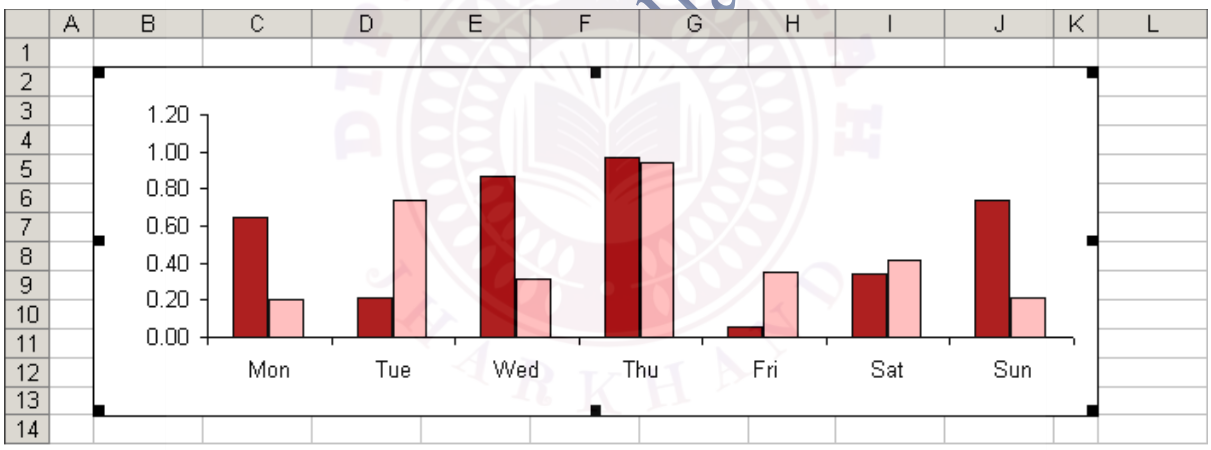

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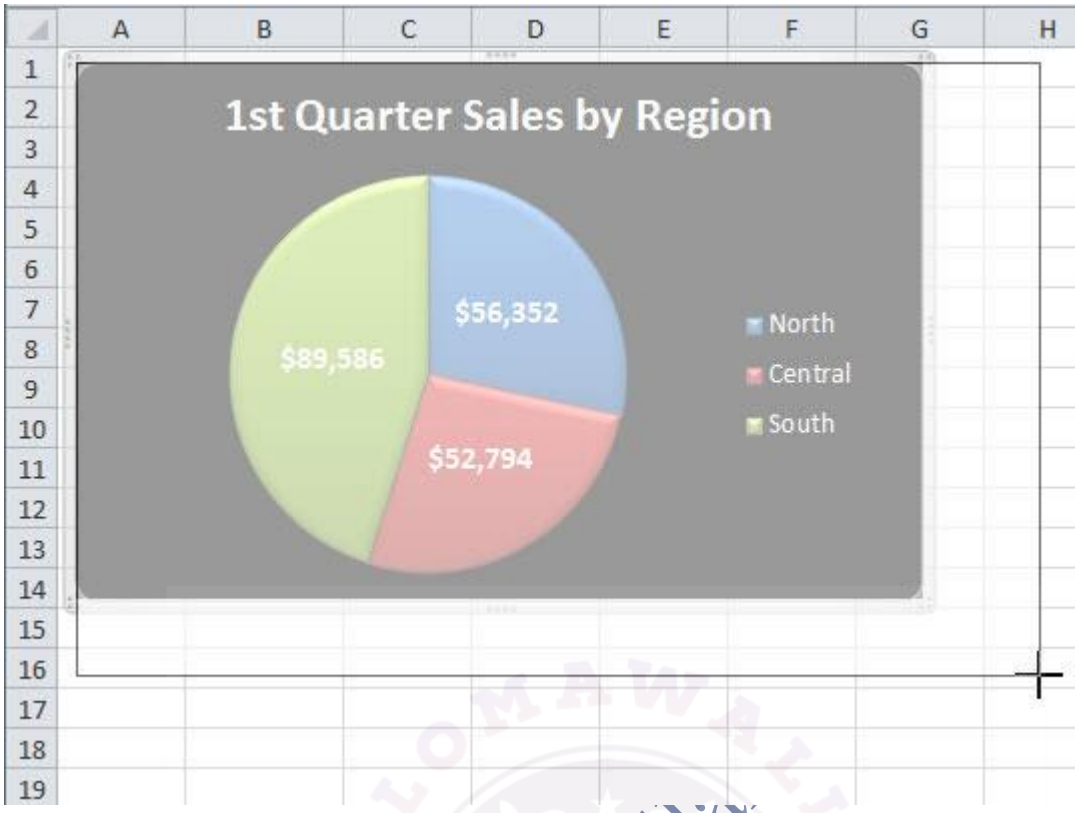

What it is:

- **Chart Wizard / Recommended Charts** refers to Excel's guided functionality (Insert > Recommended Charts or "See All Charts") that helps you choose chart types based on your data. (Microsoft Support)
- *Modifying charts* includes tasks like changing chart type, adding/removing series, editing titles/labels, changing colors.
- *Moving an embedded chart* means relocating the chart within the worksheet or moving it to a new sheet.
- *Sizing an embedded chart* means changing its dimensions (width/height) so it fits nicely in your sheet or dashboard layout.

Why it matters (theory):

- The wizard helps you pick a chart type appropriate for your data, which is key in data visualisation theory — choosing the right representation avoids mis-representation.
- Modifying charts ensures clarity and interpretability (labels, legends, colors), which is crucial in exam contexts where your chart should communicate clearly.
- Moving/sizing embedded charts is part of good layout practice: a chart might need to be embedded in a dashboard or a report sheet rather than fixed in one

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place. Understanding embedding vs sheet charts helps you manage workbook design.

- For exam tasks: you might be asked to "Move chart to its own sheet" or "Resize chart to cover A1:F20".

How to do / key steps:

- **Using the wizard:** Select your data → Insert → Recommended Charts → choose from the previews → OK. (Microsoft Support)
- **Modifying chart elements:** After inserting the chart:
  - Chart Design and Format tabs appear in Ribbon.
  - You can Add Chart Element → Axis Titles, Data Labels, Legend, Gridlines.
  - Change Colors/Styles via Chart Styles group. (Business Computer Skills)
- **Moving embedded chart:** Select the chart → click and drag to new position in sheet. To move to new sheet: Chart Design → Move Chart → New sheet.
- **Sizing chart:** Select chart → drag the corner handles to resize; or use Format tab → Size group → specify height/width. You can also right-click → Format Chart Area → Size & Properties.
- When you modify series or axis, re-check that your labels still make sense.

Exam-style answer tips:

- Define each term: "Chart Wizard/Recommender", "embedded vs sheet charts".
- Use sample: "I inserted a chart using Recommended Charts → selected Column Clustered; then changed the chart title to 'Quarterly Sales'. I moved the chart to a new sheet named 'Chart_Sales' using Move Chart dialog. Then I resized it to width = 20 cm, height = 12 cm via Format pane."
- Also mention layout best practice: "Put the chart above the data table, ensure it's large enough to show labels, avoid overlapping gridlines or other objects."

Important theory note:
Choosing a chart type via wizard is only the first step. Good data visualisation practice requires reviewing the resulting chart for clarity: Are the axes labeled? Is the legend clear? Are colors consistent? Embedding and sizing affect readability—too small, and viewers can't read labels; too large or overlapping and layout suffers.

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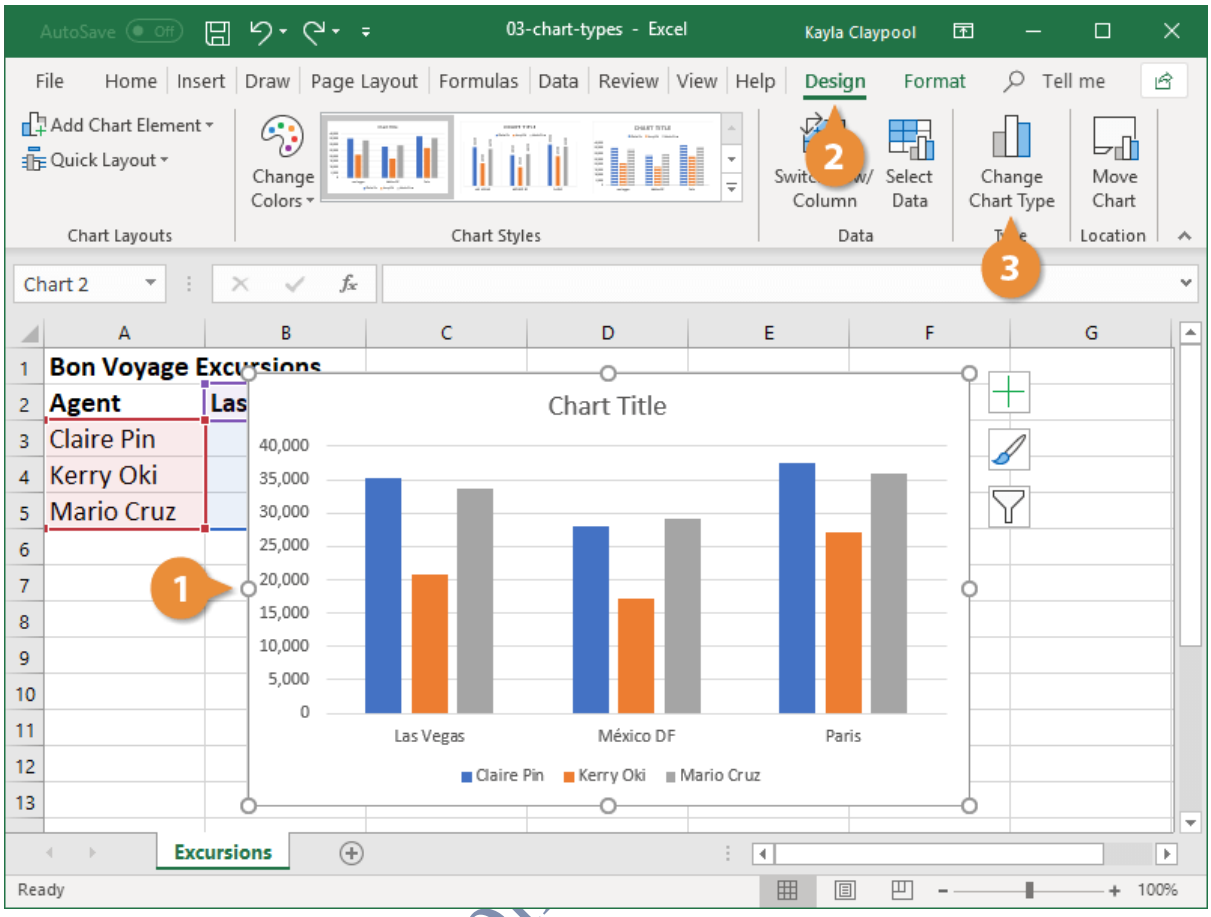
4.3 Changing the Chart Type • Changing the Way Data is Displayed • Moving the Legend



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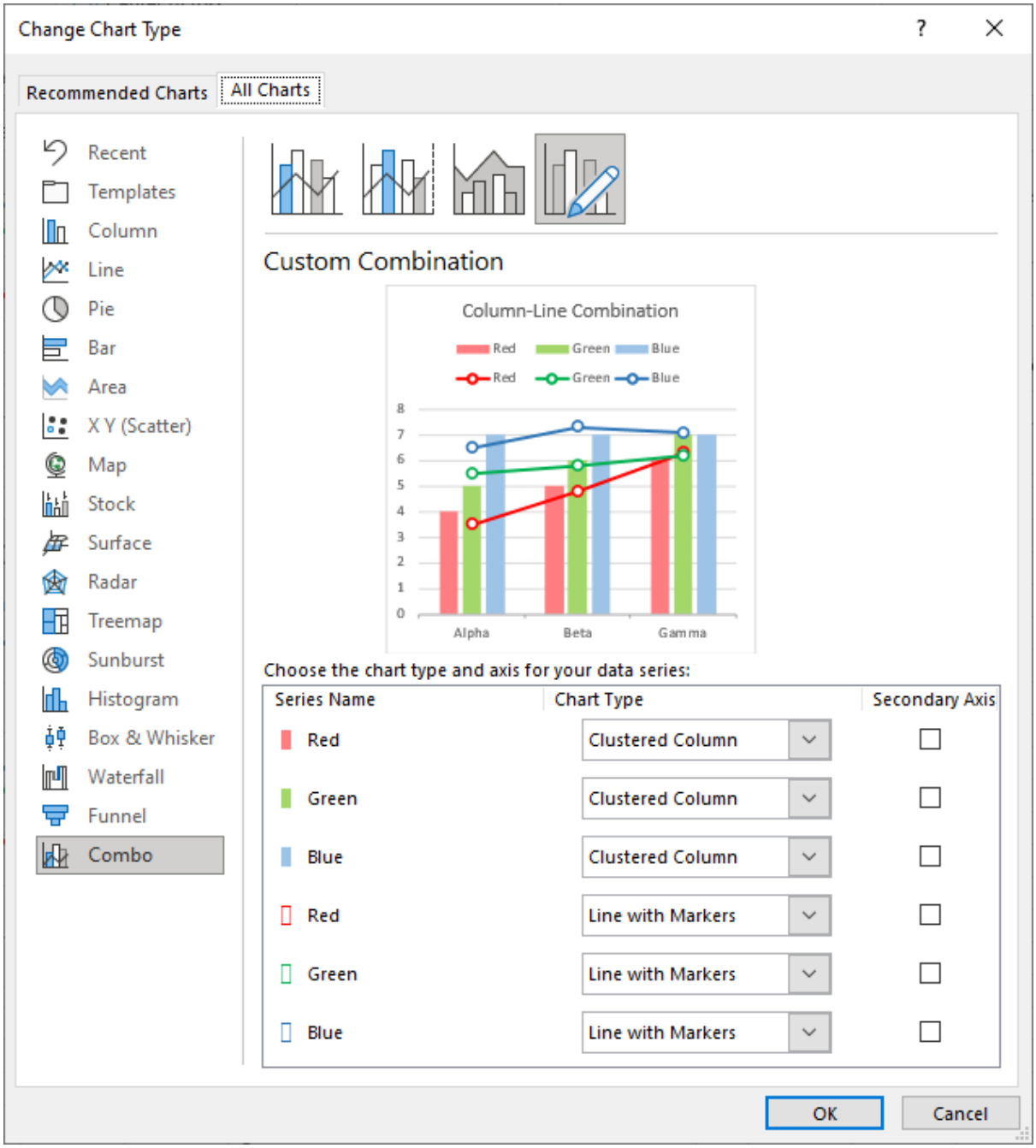
Change Chart Type
Recommended Charts
All Charts
Recent
Templates
Column
Line
Pie
Bar
Area
X Y (Scatter)
Map
Stock
Surface
Radar
Treemap
Sunburst
Histogram
Box & Whisker
Waterfall
Funnel
Combo
Custom Combination
Column-Line Combination
Red
Green
Blue
Red
Green
Blue
8
7
6
5
4
3
2
1
0
Alpha
Beta
Gamma
Choose the chart type and axis for your data series:
Series Name
Chart Type
Secondary Axis
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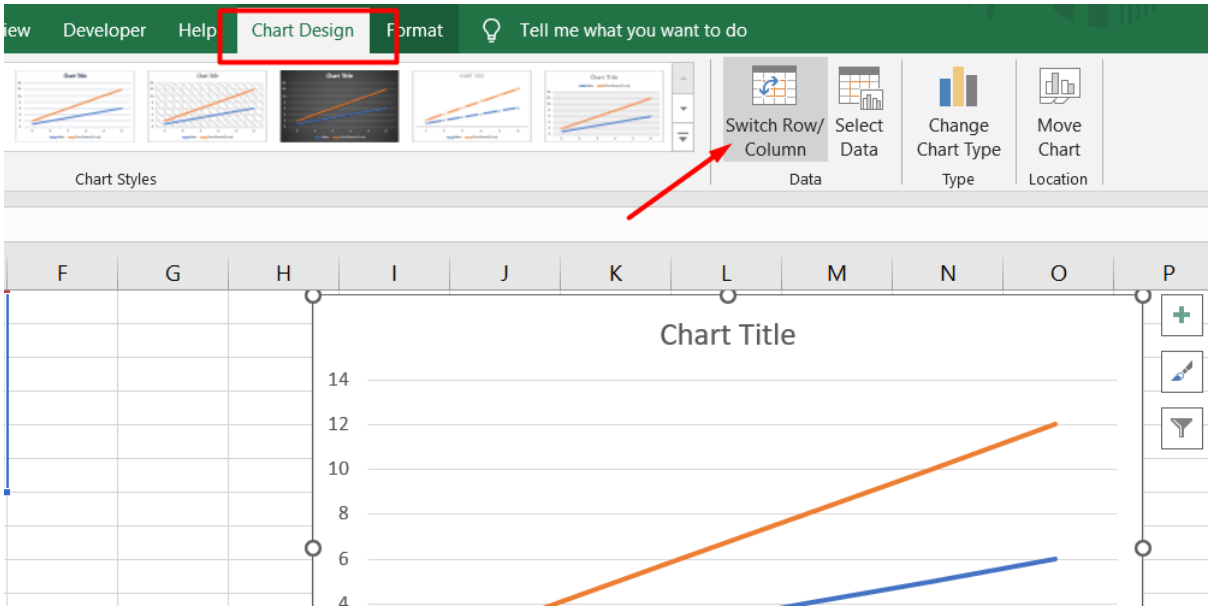
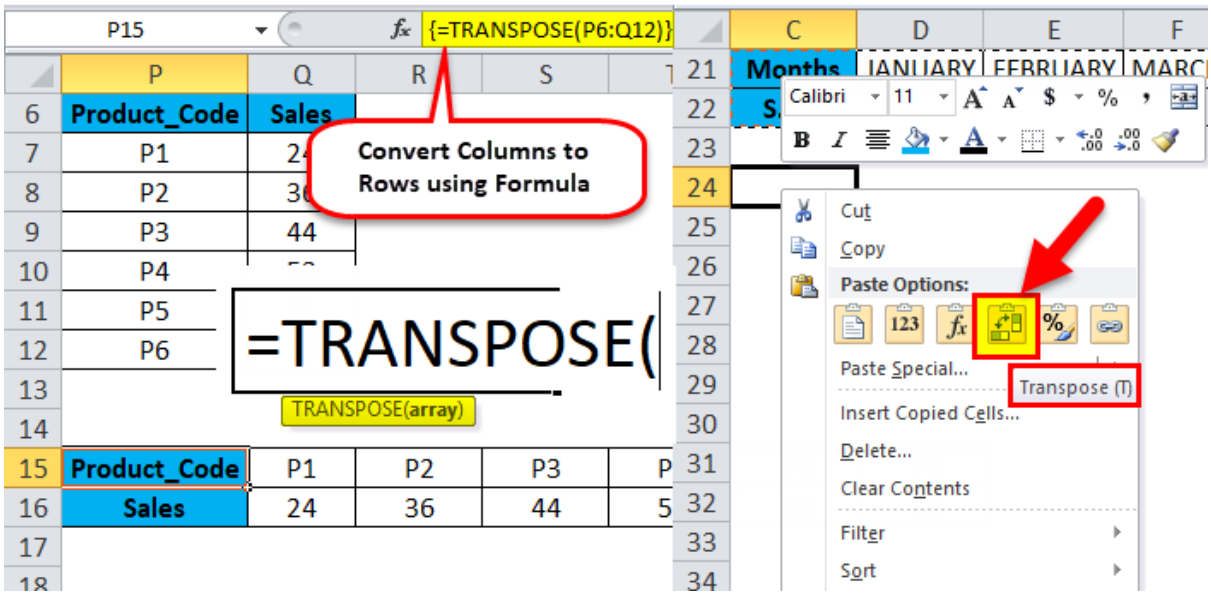
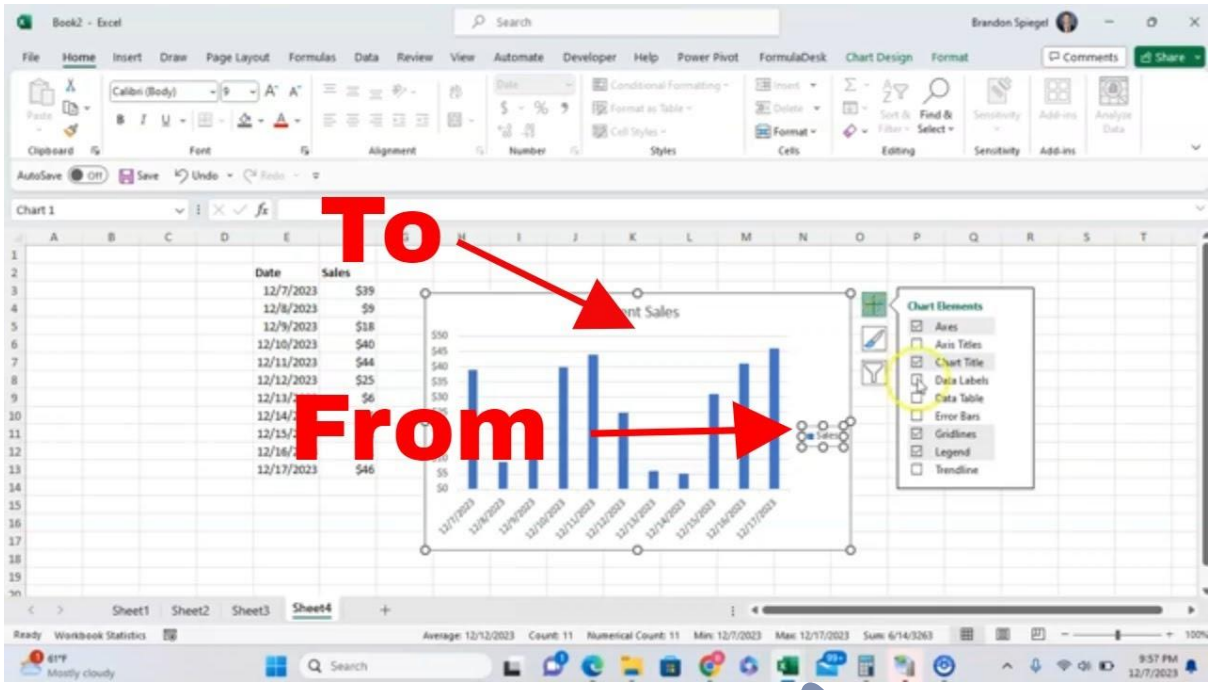
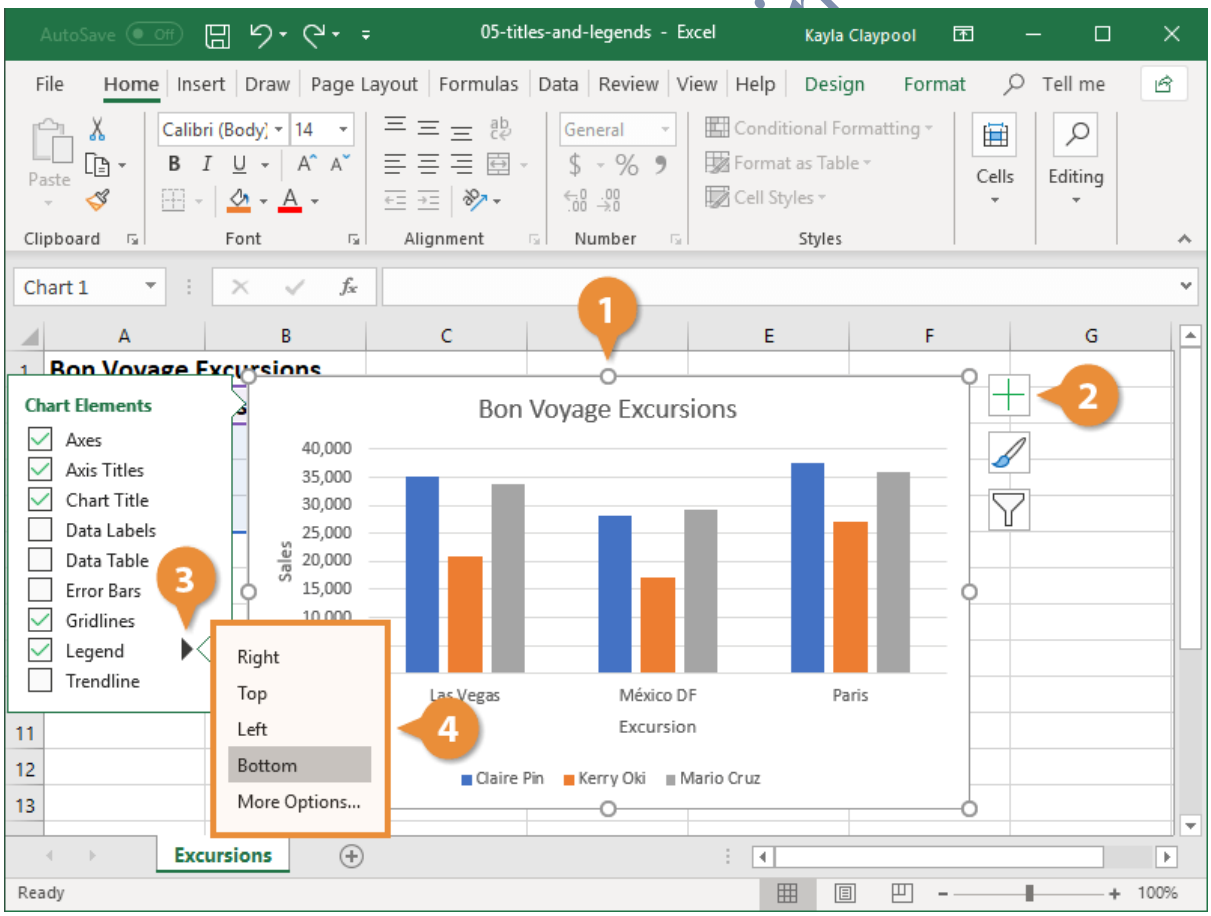
Clustered Column
Green
Clustered Column
Blue
Clustered Column
Red
Line with Markers
Green
Line with Markers
Blue
Line with Markers
OK
Cancel



Convert Columns to Rows in Excel







What it is:

- *Changing the chart type* means converting an existing chart to a different type (e.g., from Column to Line or Area) that better suits the data. (Excel Easy)

- *Changing the way data is displayed* may include switching row/column (so series and categories swap), overlaying data series, stacking bars, changing axis levels, etc.
- *Moving the legend* means repositioning the chart legend so it enhances readability (top, right, bottom, left or overlay).

Why it matters (theory):

- Data visualisation theory emphasises matching chart type to the nature of the data and the message you want. A mismatch can mislead or confuse viewers.
- Changing how data is displayed (switching row/column) changes perspective: you might originally have series = months, category = regions; swapping gives series = regions, category = months — this can provide new insight.
- The legend is part of the chart's metadata. Poor legend placement may obscure data or confuse interpretation. A well-placed legend supports the viewer's eye path.

How to do / key steps:

- **Change chart type:** Select chart → Chart Design tab → Change Chart Type → choose new type → OK. (Business Computer Skills)
- **Switch row/column (change data display):** Select chart → Chart Design → Switch Row/Column. (Excel Easy)
- **Move legend:** Select chart → Chart Elements (plus button) or use Chart Design → Add Chart Element → Legend → choose position (Right, Top, etc). Or format via Legend → Format Legend → Position.
- After change, check if the chart still clearly represents the data; sometimes new type/ arrangement requires adjusting axis or labels.

Exam-style answer tips:

- Example: "I changed the chart type from Clustered Column to Line to better show the trend over time. Then I clicked Switch Row/Column so that each region became a line series rather than each month. I moved the legend to the bottom for better layout since there were multiple regions and the right side legend was too long."
- Mention reasoning: e.g., "Line chart better shows trend; swapping row/column gives each region separate line; moving legend to bottom prevents label overlapping chart area."

Important theory note:
Changing chart type or data display should not be done arbitrarily — always check

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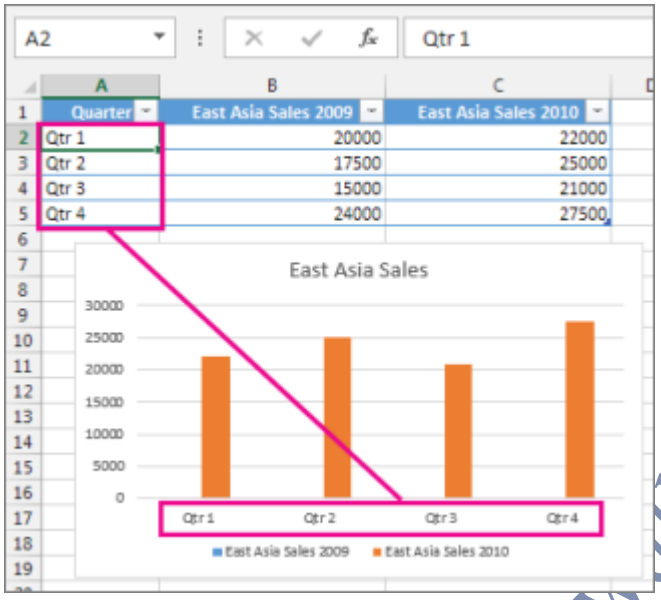
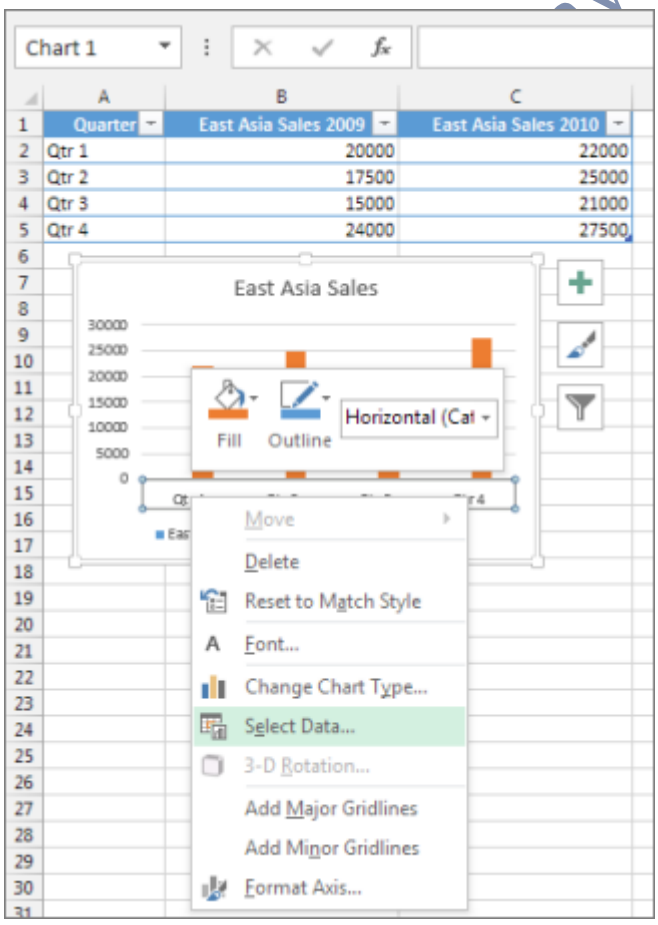
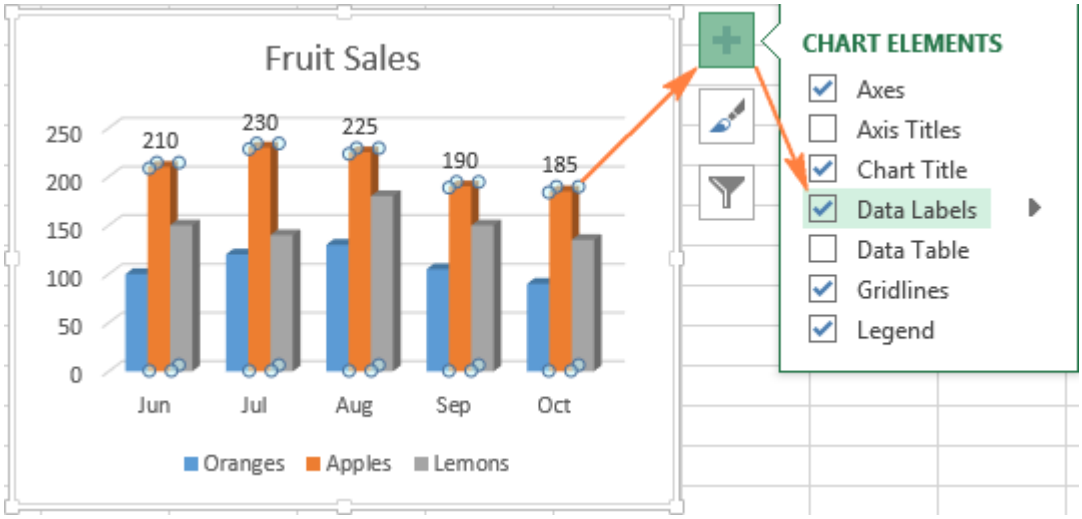
that the new format conveys the intended message better. For example, pie charts are good for percentages of a whole, but poor for time series. A chart type must fit the data and story.

4.4 Formatting Charts • Adding Chart Items • Formatting All Text • Formatting & Aligning Numbers • Formatting the Plot Area • Formatting Data Markers






Fruit Sales
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200
150
100
50
0
210
230
225
190
185
Jun
Jul
Aug
Sep
Oct
Oranges
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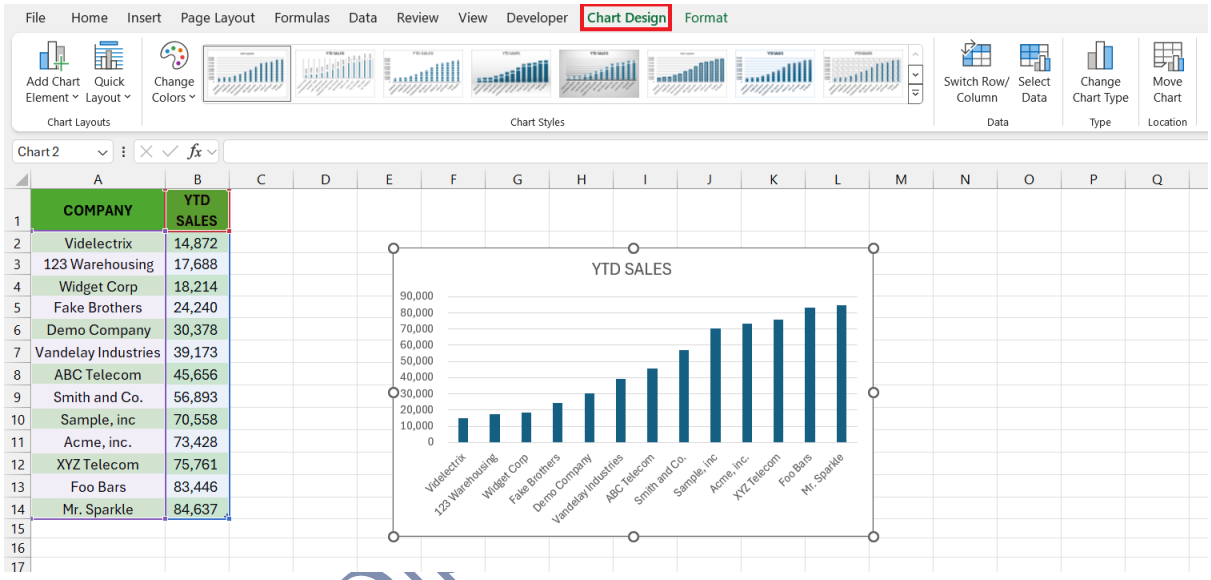
Lemons
CHART ELEMENTS
Axes
Axis Titles
Chart Title
Data Labels
Data Table
Gridlines
Legend


File
Home
Insert
Page Layout
Formulas
Data
Review
View
Developer
Chart Design
Format
Add Chart Element
Quick Layout
Change Colors
Chart Layouts
Chart Styles
Switch Row/ Column
Select Data
Data
Change Chart Type
Type
Move Chart
Location
Chart 2
COMPANY
YTD SALES
Videlectrix 14,872
123 Warehousing 17,688
Widget Corp 18,214
Fake Brothers 24,240
Demo Company 30,378
Vandelay Industries 39,173
ABC Telecom 45,656
Smith and Co. 56,893
Sample, inc 70,558
Acme, inc. 73,428
XYZ Telecom 75,761
Foo Bars 83,446
Mr. Sparkle 84,637
YTD SALES
90,000
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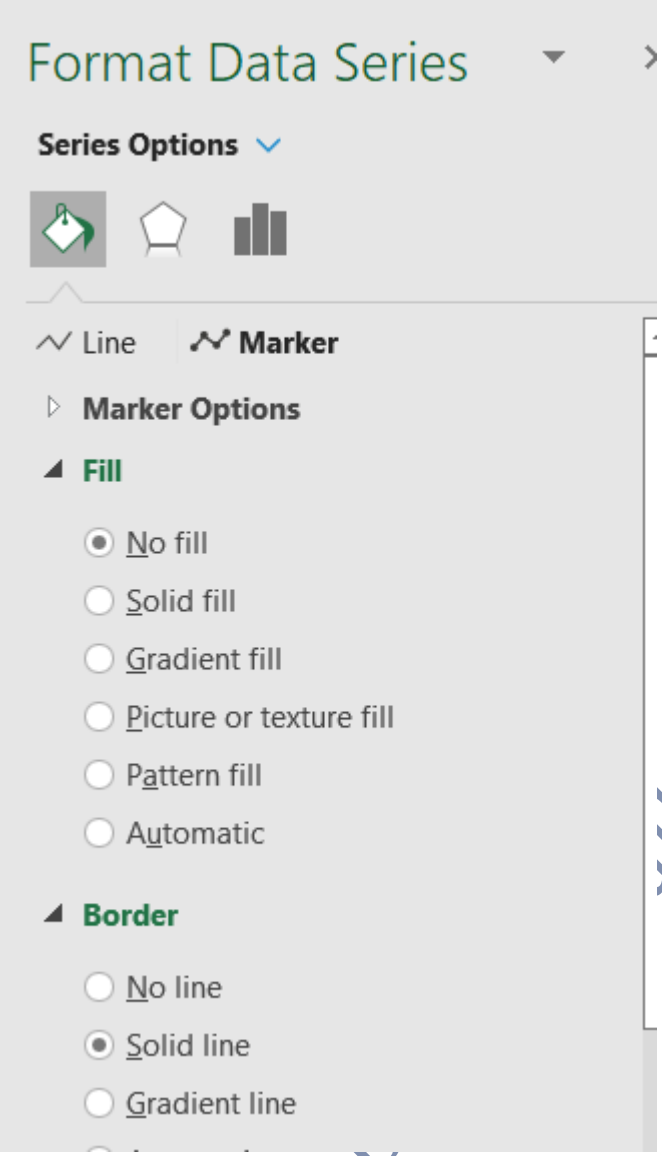
Mr. Sparkle


Format Data Series
Series Options
Line
Marker
Marker Options
Fill
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Gradient fill
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Pattern fill
Automatic
Border
No line
Solid line
Gradient line

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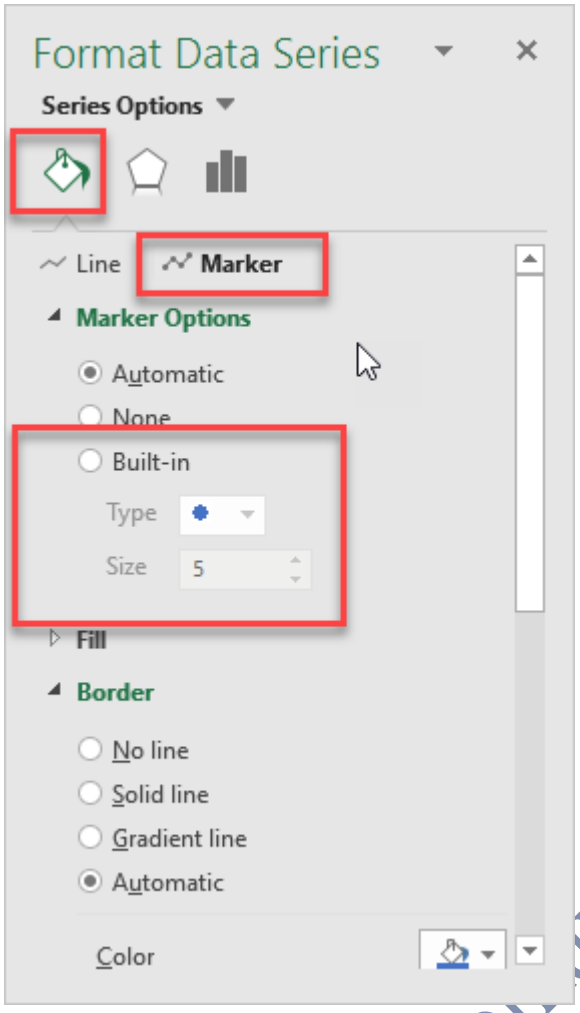

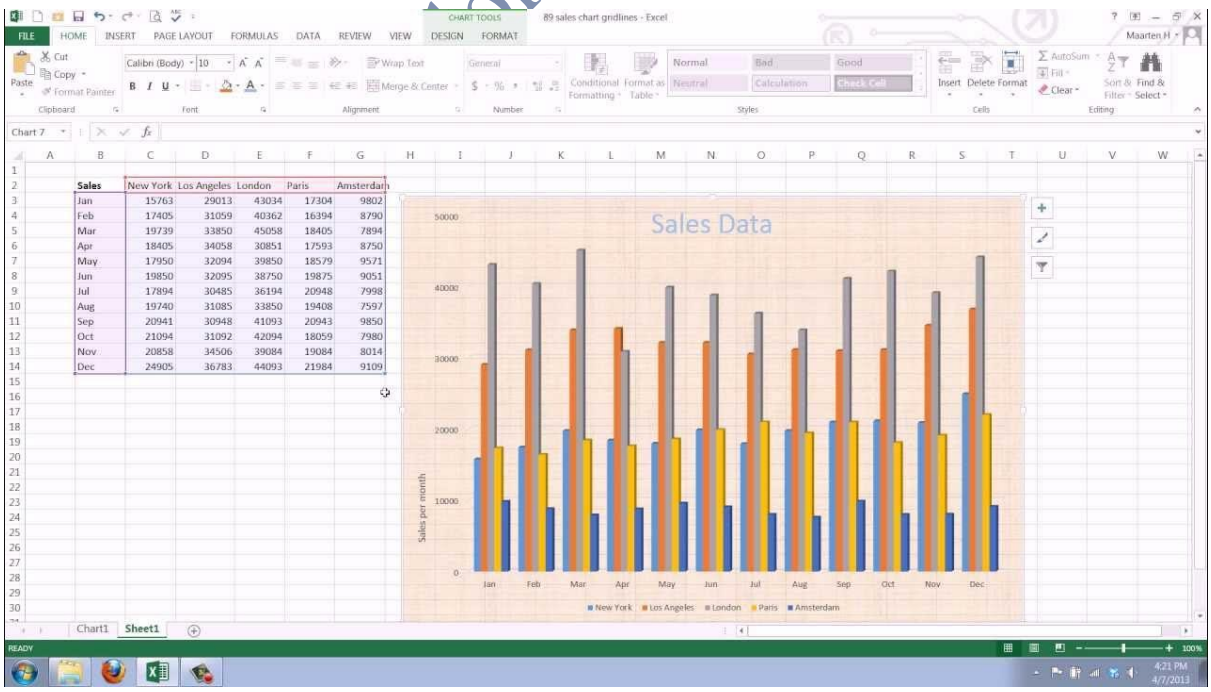

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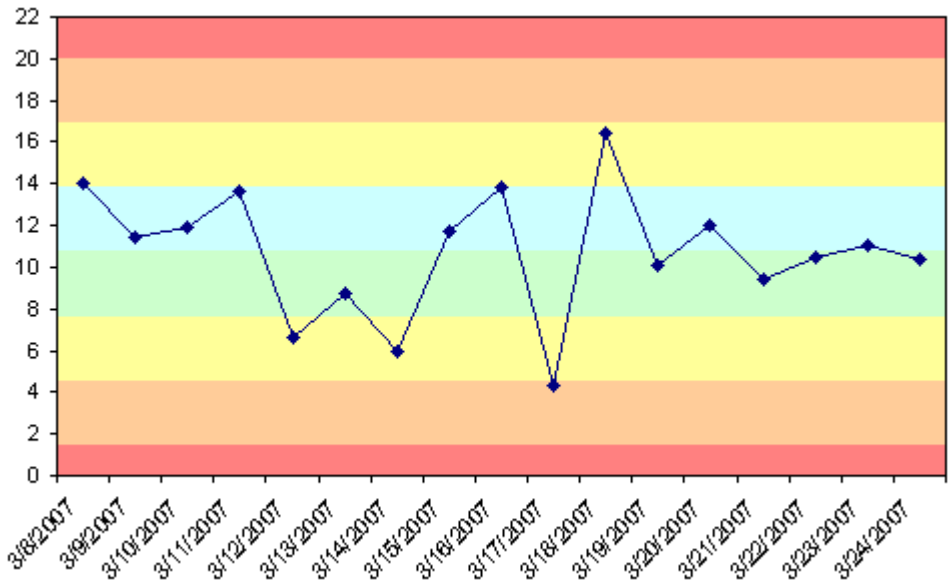

What it is:

- *Formatting charts* covers customizing the visual appearance of charts to enhance readability and aesthetics.
- *Adding chart items* means inserting axis titles, chart titles, data labels, gridlines, legend, data table.
- *Formatting all text* involves setting font type/size/style for titles, labels, legend, axis text.
- *Formatting and aligning numbers* means controlling number format (currency, %, decimals) in axis labels/data labels.
- *Formatting the plot area* is about styling the area where the data is plotted (background color, border, shadow).
- *Formatting data markers* means customizing how each series displays (color, shape, size, line style).

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Why it matters (theory):

- Visual design theory emphasises *clarity*, *consistency*, *emphasis*. Proper formatting ensures viewers focus on important data rather than being distracted by poor design.
- Adding item labels and titles gives context—without them, charts can be misleading.
- Formatting numbers ensures accuracy and avoids misinterpretation (e.g., % vs absolute number).
- Plot area and data marker styling can highlight or de-emphasize data, guiding user attention.

- In exams, you might be asked "Format the chart so that the Y-axis shows currency with two decimals" or "Add data labels to each bar".

How to do / key steps:

- Select the chart → Chart Design / Format tabs appear.
- To add items: Chart Elements button (plus icon) → check Axis Titles, Data Labels etc.
- To format text: select the element (e.g., chart title) → Format tab → Text Options → set font/size.
- To format numbers: select axis → Format Axis → Number → choose format (Currency, Percentage).
- To format plot area: select plot area → Format → Shape Fill / Shape Outline / Effects.
- To format data markers: select series → Format → Series Options, Marker Fill, Marker Border.
- Make sure chart remains readable: avoid too many text effects, maintain contrast.

Exam-style answer tips:

- Example: "I selected the chart title and set font to Calibri, size 14, bold. I added vertical axis title 'Sales (₹)' and formatted the axis numbers to currency with no decimals. I selected each data series and changed its marker color to distinct shades for each region. The plot area background was set to light grey to distinguish the chart from surrounding white sheet area."
- Mention purpose of each formatting choice: "This enhances readability and ensures the value format matches currency context."

Important theory note:
Formatting should serve the data; it is not just decoration. Overuse of effects (3D, shadows, glows) can reduce clarity. Always check the result in black-and-white or printed form, as poor contrast or small fonts reduce usability.

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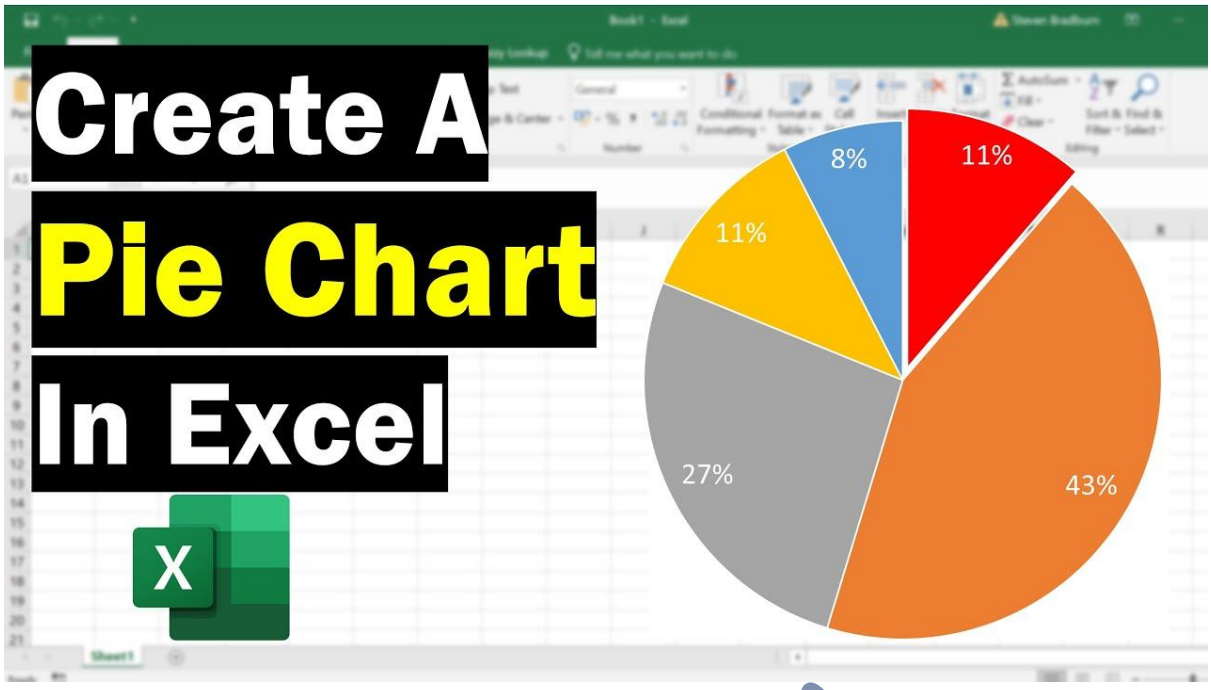
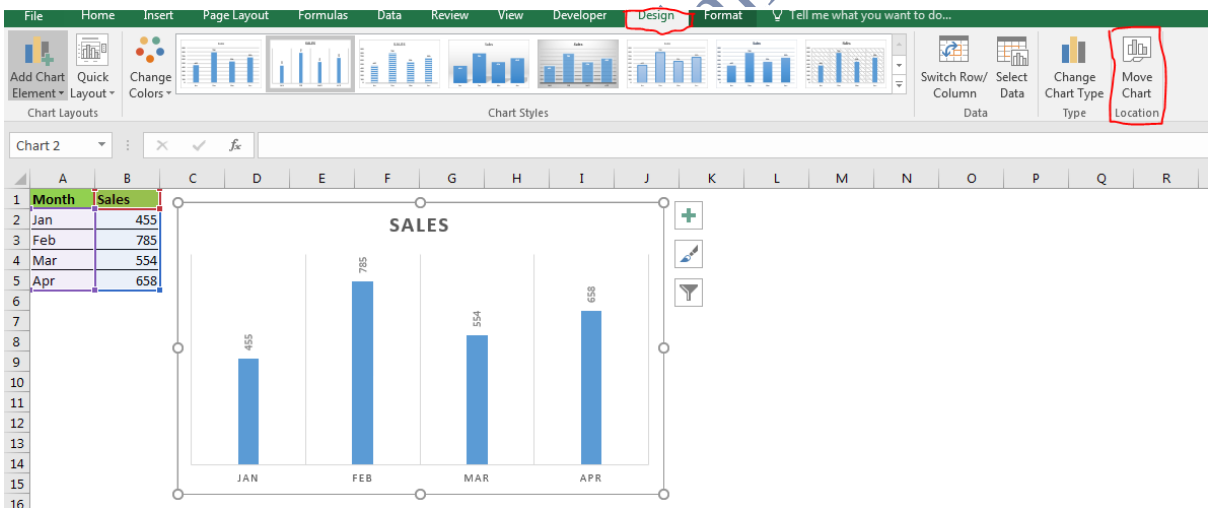
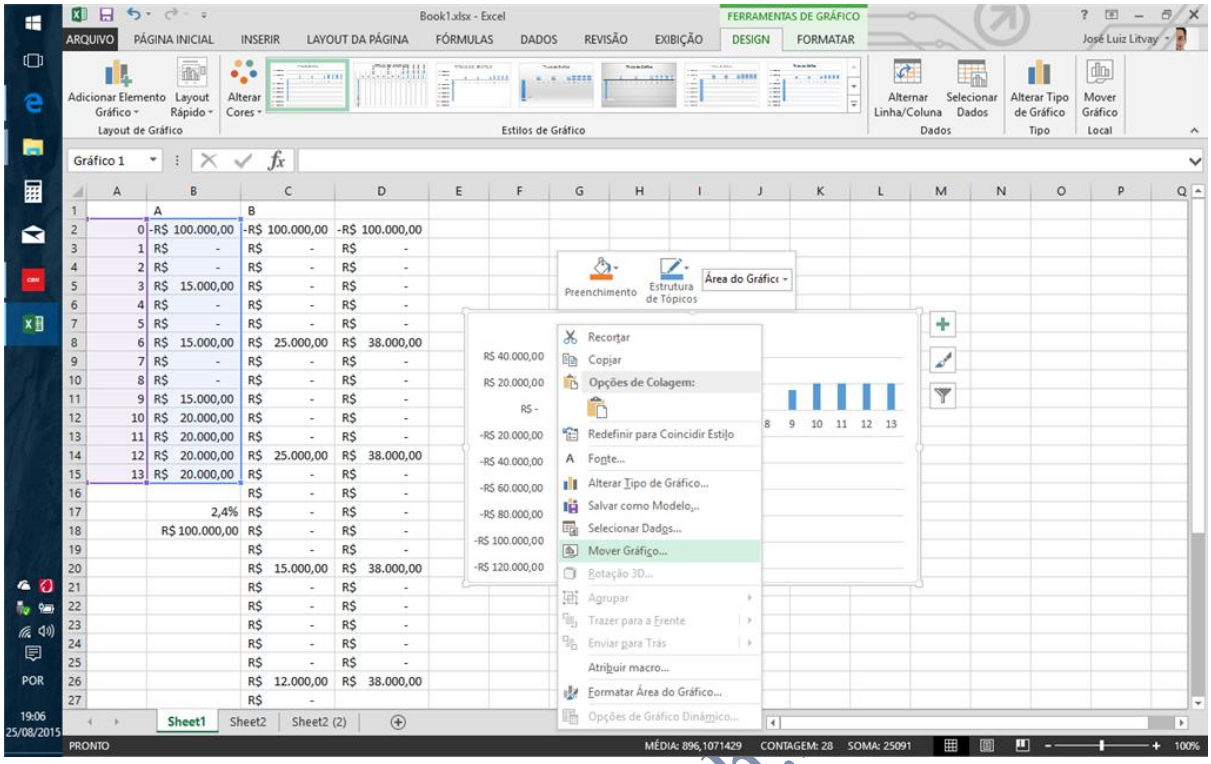
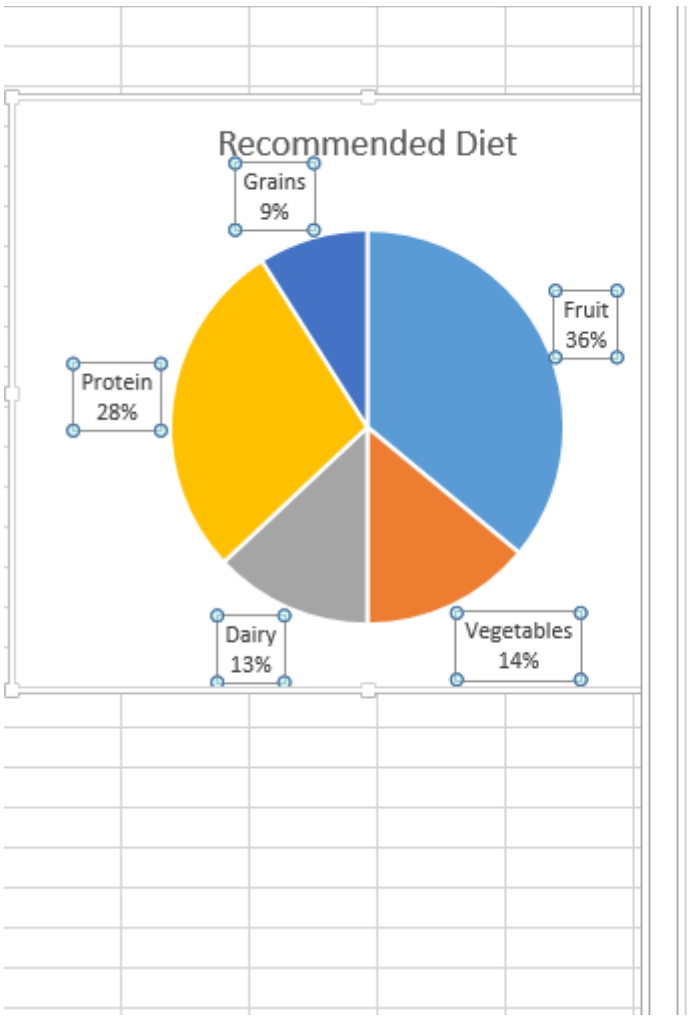
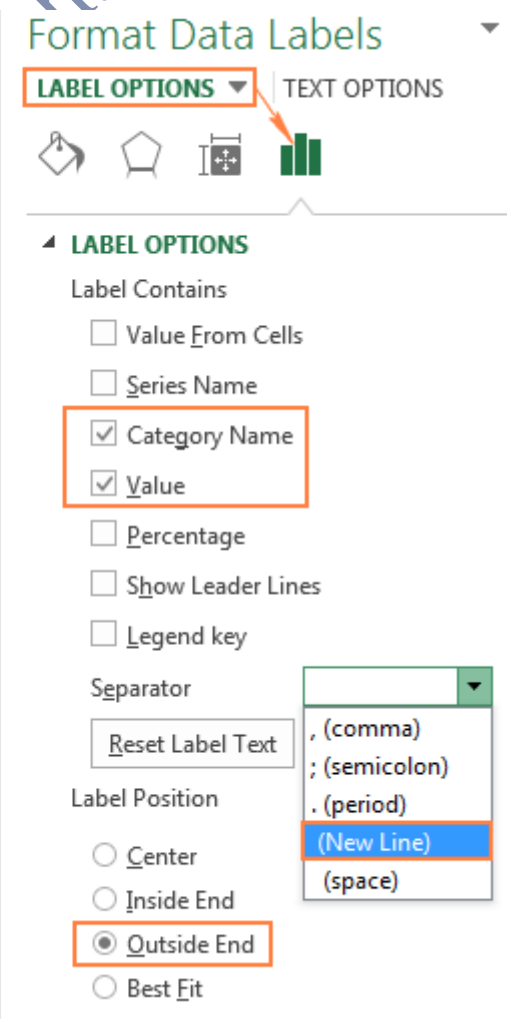
4.5 Pie Charts • Creating a Pie Chart • Moving the Pie Chart to its Own Sheet • Adding Data Labels • Exploding a Slice of a Pie Chart

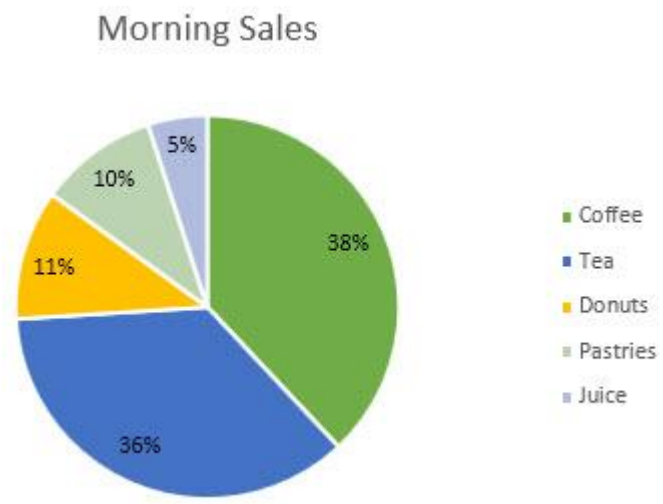

Create A
Pie Chart
In Excel
11%
43%
27%
11%
8%

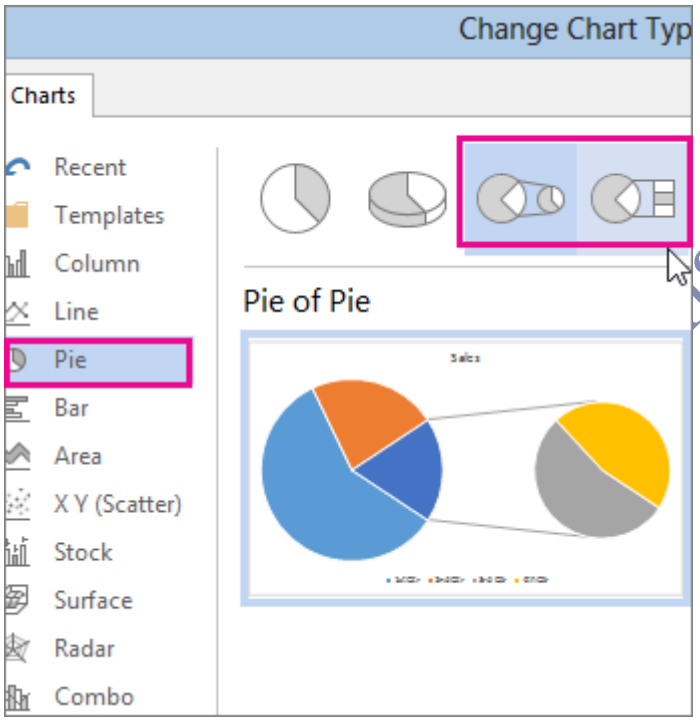

File Home Insert Page Layout Formulas Data Review View Developer Design Format Tell me what you want to do...
Add Chart Element
Quick Layout
Change Colors
Chart Layouts
Chart Styles
Switch Row/ Column
Select Data
Data
Change Chart Type
Type
Move Chart
Location
Chart 2
Month Sales
Jan 455
Feb 785
Mar 554
Apr 658
SALES
455
785
554
658
JAN
FEB
MAR
APR


Book1.xlsx - Excel
FERRAMENTAS DE GRÁFICO
ARQUIVO
PÁGINA INICIAL
INSERIR
LAYOUT DA PÁGINA
FÓRMULAS
DADOS
REVISÃO
EXIBIÇÃO
DESIGN
FORMATAR
Gráfico 1
Recortar
Copiar
Opções de Colagem:
Redefinir para Coincidir Estilo
Fonte...
Alterar Tipo de Gráfico...
Salvar como Modelo...
Selecionar Dados...
Mover Gráfico...
Rotação 3D...
Agrupar
Trazer para a Frente
Enviar para Trás
Atribuir macro...
Formatar Área do Gráfico...
Opções de Gráfico Dinâmico...
Sheet1
Sheet2
Sheet2 (2)
PRONTO


Recommended Diet
Grains 9%
Fruit 36%
Protein 28%
Dairy 13%
Vegetables 14%


Format Data Labels
LABEL OPTIONS
TEXT OPTIONS
LABEL OPTIONS
Label Contains
Value From Cells
Series Name
Category Name
Value
Percentage
Show Leader Lines
Legend key
Separator
Reset Label Text
Label Position
Center
Inside End
Outside End
Best Fit
, (comma)
; (semicolon)
. (period)
(New Line)
(space)





What it is:

- A *Pie Chart* displays parts of a whole—each slice represents a category's contribution to the total.
- *Creating a Pie Chart* means selecting category labels and values, then inserting a pie chart.
- *Moving pie chart to its own sheet* means placing the chart on its separate sheet (chart sheet) rather than being embedded.
- *Adding Data Labels* is placing labels on slices showing values or percentages.

- *Exploding a slice* means pulling one or more slices out slightly from the rest, to emphasise that category.

Why it matters (theory):

- Pie charts are conceptually simple and effective when you have **limited categories** (usually fewer than 6–8) and want to show proportions of a whole. Data visualisation best practice advises caution: too many slices or similar sizes reduce clarity. (blog.hubspot.com (HubSpot Blog))
- Moving to its own sheet may give the chart more space for presentation or printing.
- Data labels improve comprehension by showing exact values/percentages.
- Exploding a slice is a visual emphasis technique — drawing attention to a category (e.g., "Other" or "Top product").
- In exam questions you could be asked: "Create a pie chart of product categories, show percentages, explode the largest slice."

How to do / key steps:

- **Create Pie Chart:** Select data (category labels + values) → Insert → Pie Chart → choose type (2-D Pie, 3-D Pie). (See LifeWire guide) (Lifewire)
- **Move to own sheet:** Select chart → Chart Design → Move Chart → select "New sheet" option → OK.
- **Add Data Labels:** Select chart → Chart Elements (plus icon) → Data Labels → choose position (Outside End, Center etc). Then format labels (show percentages + category name).
- **Explode a slice:** Click the slice you want, drag it outward slightly. Or right-click series → Format Data Point → Pull Out value.
- After adding, check readability of labels (especially if many small slices). Consider combining small slices into "Other" category for clarity.

Exam-style answer tips:

- Example: "I selected the table of 'Product Category' vs 'Total Sales', then Insert → Pie Chart → 2D Pie. I moved it to its own sheet named 'Pie_Category'. I added data labels showing percentage and category name. I then exploded the 'Electronics' slice by pulling it out 10% to highlight that category."
- Explain reasoning: "Pie chart is appropriate because I'm showing relative contributions of categories. I exploded the largest slice to draw focus. Moving to its own sheet gives enough space for presentation."

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Important theory note:
While pie charts are popular, they should be used sparingly and appropriately: when categories are limited and summing to a meaningful total. If you have many categories or differences are subtle, a bar or column chart may communicate better. Also, make sure slices are ordered or colour coded for clarity.

✅ Summary Table for Unit IV

Section	Key Tools & Concepts	Why Important for Data Visualization
4.1	Simple Charts + Non-Adjacent Selection	Basic visualization skills; selecting correct data is foundational
4.2	Chart Wizard/Recommended, Modify, Move, Size	Enables choosing the right chart, embedding it in layout, and resizing for presentation
4.3	Changing Chart Type, Data Display Arrangement, Legend Position	Ensures chart type and layout match purpose and enhance readability
4.4	Formatting Charts, Adding Items, Style & Alignment	Visual design and labeling are key to effective communication of insights
4.5	Pie Charts, Move to Sheet, Data Labels, Exploding slices	Show proportions of a whole; presentation and emphasis techniques

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Exam preparation tips:

- For each concept, practice in Excel: create sample data and perform each task.
- Be able to explain *why* each step is done (not just how).
- Be ready to mention menu paths (Insert → Chart, Chart Design → Move Chart, Format → Series Options) as exam may ask for procedure.
- Compare good vs bad practice (e.g., when NOT to use a pie chart).

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