**Practice Activity Number 1**

1. Open up Power BI, and in a new Power BI file use this workbook to "Get Data" from the spreadsheet "PA - CDs" (not: "CDs", but "PA - CDs". This is a special version of the CDs spreadsheet for these Practical Activities).

2. Click on the fields "File extension" and Size.

3. If this visualization is showing a bar chart, please change it to a Table.

4. Save this page to your local hard drive, and publish it to the Power BI service.

**Practice Activity Number 2**

1. Check the default summarization for the "Size" field.

2. Add the "Date created" field into the visual as well. Put it after the "File extension" but before the "Size" field.

3. Has it created a detailed hierarchy? If so, right-hand click on "Date created" in the "Column" well and select "Date created" (instead of "Date hierarchy")

\* If it hasn't, then your system may have auto date hierarchies switched off. To switch it on, go to File > Options and Settings > Options > Data Load (Current File) > Auto Date/Time.

4. Change the summarization for "Date created" to "Earliest", just for this visualization (don't change the default).

5. Change the default formatting of the "Date created" field so that it just shows month and year.

6. Change the font size of the visualization.

7. Change the colour of the header background.

8. Change the format of the "Size" field so that it displays in Millions of bytes.

9. Copy this visualization to create a second visualization, and alter this second visualization so that it has just two columns: Year of "Date created", and "Size".

10. Move the first visualization so that the centre of it is half way down the page, and move the second visualization so that the top of the visualizations are the same.

**Practice Activity Number 3**

Using the "PA - CDs" spreadsheet in the "PowerBIData" workbook, please have a go at the following activity:

1. Create a Matrix, with Year of "Date created" in the Rows well, "File extension" in the Columns well, and "Size" in the Values well. Use the "alternating rows" style.

2. Change the formatting of the "Size" in this visualization only so that it displays in Millions.

3. Add "Quarter" into the Rows well. Have a look at the different options in Visual tools - Data/Drill - Data actions.

4. Add a second visualization, a Stacked Column Chart, with "File extension" in the X-Axis (or Axis) well, and "Size" in the Y-Axis (or Value) well.

5. Add a third visualization, an Area Chart, with Year and Quarter of "Date created" in the Axis well, and "Size" in the Value well. If you are seeing only years, click on "Expand all down one level in the hierarchy" to show both Year and Quarter.

6. Edit the interactions, so that when you click on the first visualization, it filters (not highlights) the second visualization.

7. In the first visualization, click on the year 2010, and see what happens.

**Practice Activity Number 4**

Using the "PA - CDs" spreadsheet in the "PowerBIData" workbook, please have a go at the following activity:

1. In the first page, create a table, which summarises "Year of Date created" and Size. Duplicate this as a stacked column chart, and then again as a stacked column chart, but with "Month of Date created" instead of Year.

\* Have a problem with this step? See the bottom of this Practice Activity.

2. Filter the table, so that it only shows those items/rows with the top 10 values by Size.

Hint - you can filter the # field to select "items", and then show the Top 10 "By Value" Size.

Note: this will only show 6 years, as some of the top 10 are in the same month.

3. In the table, add in the "#" field after Year and before Size. Don't summarise the "#" field (so at the end, you should have 10 rows plus the Total row in this table).

4. Sort the table in descending order of Size (so the biggest size goes on the top)

5. Add the Year of "Date created" as a slicer, and slice on the years 2010 to 2014. Create a bookmark based on this, but only for the "selected visual".

6. Slice on the years 2006 to 2009, and create a second bookmark based on this. Then slice on all the years, and create a third bookmark.

7. On a second page, create an area chart with "Date created: Year and Month" on the Axis, "File extension" on the Legend and "Size" on the values. Ensure you can see all of the months - if necessary, click on "Expand all down one level in the hierarchy". Rename this second page "Breakdown by month".

8. Add a Drill-through on this second page for "Date created: Year".

9. A "Back" arrow has appeared. Arrange the visualizations so that the Back arrow does not overlap a visualization, and add Button Text of "Back".

10. Go back to the first page (which you can rename "Dashboard") and the 2010-2014 bookmark. Drill through from the first page to "Breakdown by month" for the year 2011.

And why not experiment with making the dashboard look nice? How about changing the theme to Frontier, adding titles, formatting numbers, adding data labels and more?

In this example, I do the following:

* Size and Style (or in Effects for older versions)
  + Background - Theme colour 6, 60% lighter.
* Title
  + Background - Theme colour 6, 20% lighter.
  + Text - White
  + Size - 20
* Data labels - On.
  + Values - size 18
  + Display units - Millions
* X-axis (or Axis, depending on your version of Power BI)
  + Values - Size 13
  + Colour - Black
* Then use Format Painter to copy the styles onto other visuals.

Save this dashboard, as we will be developing it in Practice Activity 5.

\* Do you not have a date hierarchy in step 1? Your system may have auto date hierarchies switched off. To switch it on, go to File > Options and Settings > Options > Data Load (Current File) > Auto Date/Time.

**Practice Activity Number 5**

This Practice Activity continues from the dashboard that we created in Practice Activity 4.

1. Rename the "Breakdown by month" page as "Breakdown".

2. Change the area graph to a pie chart, and resize it so that it fits in the top-left hand corner.

3. Create a scatter chart (which is really a bubble chart) which shows Day of "Date created" in the X Axis, Size in the Y-Axis, and Count of "#" in the Size. This graph should be in the top-right hand corner.

4. Create a waterfall chart with Path in the Category and Size in the Values (in older versions, this was called the "Y axis"). This should go along the bottom of the page (but still leave room for the "Back" button).

5. Go back to the Dashboard, and select "All years" from the Bookmarks.

6. Drill through to the "Breakdown" page using the year 2007, and then the year 2014. Have a look at the waterfall chart both times - would it work better as a Tree map or a Donut chart?

7. In the "Dashboard" page, see what the "Size by Month" chart would look like as a Ribbon, with "File extension" in the Legend, compared as a Stacked column chart. Which looks better?

**Practice Activity Number 6**

Let's practice making maps in Power BI. It looks like a long Practice Activity, but most of the steps are very short.

1. Load the "PA - Maps" spreadsheet from the PowerBIData workbook.

2. Create a Map with CountryRegionCode and then (as a second level) StateProvinceCode.

3. Add Count of "AddressID" to Size - what extra information does this tell you?

4. Click on "go to the next level in the hierarchy". Notice the dot in Argentina, South America - why do you think there is a dot there?

5. Drill back up and then click on "Expand all down one level in the hierarchy". Is the Argentina dot removed?

6. Enable the "Zoom buttons", but take "Auto zoom" off.

7. Add in City and PostalCode into the Location, and zoom in on either:

a. British Columbia, Canada (just north of Seattle, Washington),

b. London, England,

c. Paris, France, or

d. Melbourne, Australia.

8. Keep clicking on "Expand all down one level in the hierarchy" - what happens to the location of the dots?

9. Click "Category labels" to On, and zoom in and out - how useful are they to you?

10. Zoom out fully, and drill up to the Country level, and change the map to a "Filled Map".

11. Change the Default colour (in Data colours), so that instead of it being one colour, it uses Conditional Formatting. Change it so that it has "Diverging" colours, from blue to a dark yellow to green.

12. Click on "Expand all down one level in the hierarchy", and then a second time - what happens? And why?

13. Change it back to a "Map", and use the Data Category to categorise the Country, State, City and Postal Code fields.

14. Remove the locations, and create a Hierarchy called "Location" using CountryRegionCode, StateProvinceCode, City and PostCode. Hide the original fields, and the "Location" Hierarchy in the Location.

15. Change it back to a "Map", and switch "Heat map" to On. Click on "Expand all down one level in the hierarchy", and then a second time - what happens?

16. Change the Heat Map colours so that the 0%, 50% and 100% gradient stops are different shades of red.

**Practice Activity Number 7**

In this Practice Activity, you have been commissioned by the US National Highway Traffic Safety Administration to create a dashboard.

It needs to show the improving road safety over the time period 2007-2018 by state. The target the NHTSA has is 1.02 fatalities per 100,000,000 miles driven.

To assist you, please use the spreadsheet "PA - Driving Safety" from the workbook "PowerBIData". The spreadsheet has:

* The state, year, miles traveled and actual fatalities,
* The actual fatalities per 100,000,000 miles.
* The target level of fatalities, and
* The actual fatalities per 100,000,000 miles in the last year of the data, 2018.

This dashboard should have the following features:

1. A slicer in which you need to select a state. (Hint: In "Selection controls", select "Single Select" to On).

2. A card which shows the state selected.

3. A gauge which shows the 2018 actual fatalities per 100,000,000 miles.

The gauge show go from 0 to 2.5, and should have a target of 1.02.

The colour of the gauge should be conditional on the value - blue if 0.8, yellow if 1.02, and red if 2.50.

4. A map, showing the state selected. The colour of this filled map should be the same as the gauge.

5. A KPI which has the indicator as Fatalities, the Trend Axis as Year, and the Target goal being the Average of Target Fatalities. (You should use: "Decreasing is positive" and "Low is good".)

6. Two cards, which show the total Miles driven, and the number of fatalities.

You should also create 3 additional charts on three separate pages:

1. A bar chart of fatalities over time. Use conditional formatting to vary the colour of the bar.

2. A bar chart showing number of miles driven, and

3. A line and clustered column chart showing the fatality rate (as bars) and the number 1.02 as a Line value.

Hint: You need a new column to show the 1.02 number. It could say something like: Target1.02 = 1.02

These 3 charts should have a Drillthrough of State (and therefore you need to accommodate a "Back" button). You can drill through using the map.