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Abstract

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Data Visualisation

***Assignment 1 – 23rd August 2024***

Contents

[Data Visualisation 0](#_Toc174040374)

[Introduction 2](#_Toc174040375)

[Data Policies and Principles 2](#_Toc174040376)

[Visualising Data Using Excel 3](#_Toc174040377)

[The Data: 3](#_Toc174040378)

[Step 1: Create a Workbook Password 3](#_Toc174040379)

[Step 2: Change the Data Type in a Column 4](#_Toc174040380)

[Step 3: Turn the GDP Sheet into a Table 5](#_Toc174040381)

[Step 4: Filtering the Table 6](#_Toc174040382)

[Steps 5 to 7: Creating a Chart for Rank, Country and GDP per Capita 7](#_Toc174040383)

[Step 8: Creating a Sort for the Top 20 Highest Ranking Countries 9](#_Toc174040384)

[Step 9: Creating a Bar Chart for the Top 20 Highest Ranking Countries 10](#_Toc174040385)

[Step 10: Creating Macro Buttons for Print, Save and Copy 11](#_Toc174040386)

[References 13](#_Toc174040387)

## Introduction

Since the advent of the internet and a host of digital platforms, the collection of data has become more than a phenomenon, being both easily accessible and overwhelmingly huge.

Today, a company’s ability to access, visualise, understand and use the data available has become essential for them to gain clearer insights, make better decisions and take the appropriate actions going forward. Therefore, being able to analyse data and present it visually in an understandable way is crucial to this process.

The purpose of this assignment is to show how I would sort, analyse and create a visual report of the data provided in the form of charts and maps by using Excel and Tableau. I will demonstrate this by providing step-by-step visuals of the processes I will undertake, first in Excel, then in Tableau.

However, I will begin first by discussing in the following section why data security and best practices are a must when dealing with data and what legal requirements have already been put in place to govern the management of data.

## Data Policies and Principles

With the increase of data being collected and processed online globally, there is an increasing need for this data to be handled correctly, ethically, securely and legally (About DAMA UK, n.d.).

The first law in the UK to protect personal data online was established under the Data Protection Act of 1998 (DPA 1998). Generally, the act regulated ‘how and when information relating to an individual may be obtained, used and disclosed’ and gave the individual the legal right to access their own personal data (Lindsay Jordan, Stephen Avila, n.d.). However, as the online environment evolved, a more comprehensive law was needed.

In 2018, the European Union established the General Data Protection Regulation (EU GDPR). At the same time, the UK updated and replaced their existing DPA 1998 with the new Data Protection Act 2018 (DPA 2018) to bring UK data laws in line with it(Guide to the General Data Protection Regulation (GDPR), n.d.). Then, following the UK’s exit from the EU, the UK General Data Protection Regulation 2020 (UK GDPR) was established, which effectively mirrors the EU GDPR with some minor differences to make it specific to the UK (The DPA 2018 and UK GDPR, n.d.).

In addition to this, the Data Management Association (DAMA UK - (About DAMA UK, n.d.)) provided a set of data management principles to ensure that shared data is being stored, analysed, visualised and presented accurately and consistently across the board

Data principles every business should follow include:

1. Best practices and secure systems to legally and ethically collect, handle, store and transmit data
2. Retaining copies, backing up and regularly auditing data
3. Metadata that provides details about the characteristics and life cycle of the data
4. Publishing visualisations of data analysis through approved channels
5. Controlling access to data by placing limits where applicable and granting access to the right people at the right time.

(Data Principles, ONS, n.d.)

## Visualising Data Using Excel

I will be working with a data set in Excel called ‘The Wealth of Nations’ for this exercise. I will provide step-by-step text and screenshots to show how I proceed with first organising and transforming the data before producing the data visualisations.

## The Data:

After accessing the Excel workbook entitled, ‘Wealth of Nations’ and saving a copy for myself, I examined the data. I could see that there were three sheets of data, each covering a different category: GDP, Life Expectancy, and Smartphones. They each contained 4 columns of data: Rank, Country, the category, and the year the information was obtained.

## Step 1: Create a Workbook Password

Before making any changes to the data, I applied a password to protect the Excel workbook, as follows:

1. In the Review Tab, I selected Protect Sheet in the Protect section:

A screenshot of a computer

Description automatically generated

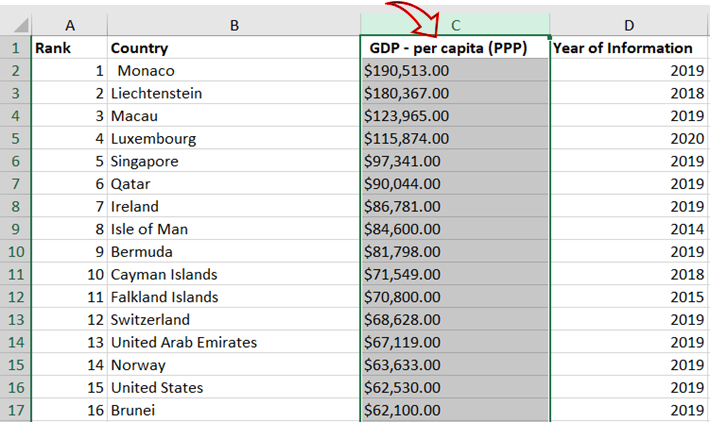
1. I then set the following password: *LPearce005* in the field as shown below:

A screenshot of a computer

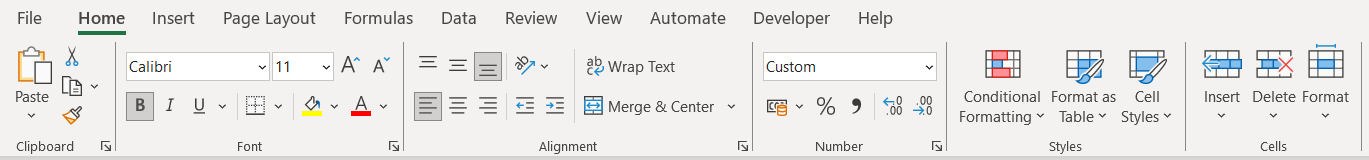
Description automatically generated

## Step 2: Change the Data Type in a Column

1. To change the data type in Column C, I first selected the column:



1. Then I clicked on ‘Format’ in the Cells section under the Home Menu to open up the Format Cells window (this can also be done by right-clicking on the column header and selecting ‘Format Cells from the drop-down):



1. I then selected ‘Currency’ in the Category box, the £ symbol in the ‘Symbol field and ensured the decimal place was set to ‘2’:

A screenshot of a computer

Description automatically generated

1. Column C now appears with the British Pound currency sign instead of the original dollar sign:

A screenshot of a computer

Description automatically generated

## Step 3: Turn the GDP Sheet into a Table

1. First, I selected the columns with the data, then clicked on ‘Format as Table’ in the Home Menu:

A screenshot of a computer

Description automatically generated

1. I selected ‘Blue, Table Style Medium’ and ticked the box for ‘My table has headers’, then clicked ‘OK’ to finish:

A screenshot of a computer error

Description automatically generated

1. The result appeared as follows:
2. A screenshot of a computer

   Description automatically generated

## Step 4: Filtering the Table

1. To filter the table to display only the data for 2019, I click on the down arrow for the ‘Year of Information’ column, which brought up the following dropdown window:

A screenshot of a computer

Description automatically generated

1. I then clicked in the ‘Select All’ tick box to deselect everything below it, then selected only the tick box for ‘2019’:

A screenshot of a computer

Description automatically generated

1. The result appeared as follows, with 229 lines of data for the year 2019:

A screenshot of a spreadsheet

Description automatically generated

## Steps 5 to 7: Creating a Chart for Rank, Country and GDP per Capita

1. First, I select the three columns labelled ‘Rank’, ‘Country’ and ‘GDP - per Capita (PPP)’:

A screenshot of a computer

Description automatically generated

1. Going to the ‘Insert’ tab, I then selected ‘Recommended Charts’ in the ‘Charts’ section and clicked on the ‘All Charts’ tab. I selected the ‘Column’ chart on the lefthand side, then clicked on ‘Clustered Column’ and chose the righthand side example:

A screenshot of a computer

Description automatically generated

1. I then edited my chart as follows:
   1. I first double-clicked on the existing title to amend it to ‘The Wealth of Nations Ranked’. I changed the font to ‘Aptos Black’ and the font size to 16 points. Then, using the ‘Format Chart Title’ section to the righthand side, I changed the font to green and set the alignment to ‘Top-Centred’:

A screenshot of a computer

Description automatically generated

* 1. Next, I clicked on ‘Add Chart Element’ in the Chart Design section to add both horizontal and vertical axis titles:

A screenshot of a computer

Description automatically generated

* 1. Finally, using the ‘Format Chart Area’ to the righthand side, I made the chart visually appealing:

A screenshot of a computer

Description automatically generated

1. I created a new worksheet by clicking on the + button at the bottom of the Excel workbook, and renamed it Nations Ranked GDP, so that I could move the chart to it as follows:
   1. First, I right-clicked on the chart to bring up the floating menu and selected ‘Move Chart:

A screenshot of a spreadsheet

Description automatically generated

* 1. This opened the following window. I selected ‘New Sheet’ and typed in the name I had already given my sheet, and clicked ‘OK’

A screenshot of a computer

Description automatically generated

## Step 8: Creating a Sort for the Top 20 Highest Ranking Countries

1. I returned to the original GDP Sheet and created a sort for the top 20 highest ranking countries by clicking on the down arrow in the ‘GDP – per capita (PPP)’ column, then selecting ‘Number Filters’ and ‘Top 10’ as follows:

A screenshot of a computer

Description automatically generated

1. In the ‘Top 10 AutoFilter’ window, I changed the number in the middle field to 20 and clicked ‘OK’

A screenshot of a computer

Description automatically generated

1. The result was my table now had only 20 rows showing the highest-ranked countries in 2019:

A screenshot of a spreadsheet

Description automatically generated

## Step 9: Creating a Bar Chart for the Top 20 Highest Ranking Countries

1. With the ‘Country’ and ‘GDP – per capita (PPP)’ columns highlighted, I clicked on the chart icon in the ‘Insert’ menu and in the ‘Charts’ section and selected the ‘2-D Bar’ option:

A screenshot of a computer

Description automatically generated

1. After giving the chart a new heading and making it visually appealing as I did for the previous chart, I positioned it under the table as follows:

A screenshot of a graph

Description automatically generated

1. I then highlighted the area behind the chart and selected the cyan colour fill from the ‘Fill Colour’ icon in the ‘Home’ menu:

A screenshot of a graph

Description automatically generated

## Step 10: Creating Macro Buttons for Print, Save and Copy

1. To create the buttons, I first went to the ‘Insert’ menu and selected ‘Icons’ from the ‘Illustrations’ menu:

A screenshot of a computer

Description automatically generated

1. In the Stock Images window, I selected the ‘Technology and Electronics’ category and chose the following icons for my ‘Print’, ‘Save’ and ‘Copy’ buttons:

A black and white image of a floppy disk

Description automatically generated

1. I added some text on top of the icons using text boxes, grouped each icon and textbox together, then formatted the colour and appearance using the ‘Format Shape’ window. I then positioned the icons below my Bar Chart:

A screen shot of a data

Description automatically generated

1. For the ‘Copy’ macro, I went to the View Menu, clicked on the dropdown for the ‘Macros’ and selected ‘Record Macro:

A screenshot of a computer

Description automatically generated

1. In the ‘Macros’ window, I labelled the macro as ‘CopySelection’, assigned ‘c’ to the Ctrl+ box and clicked ‘OK’:

A screenshot of a computer

Description automatically generated

1. I selected the area including my GDP table and Bar Chart:

A screenshot of a computer

Description automatically generated

1. I right-clicked on the selection to bring up the floating menu and clicked on ‘Copy’:

A screenshot of a computer

Description automatically generated

1. I went back to the Macros icon in the View menu and click on ‘Stop-recording:

A screenshot of a computer

Description automatically generated

1. Selecting the ‘Copy’ button I had created, I right-clicked to reveal the floating menu and selected ‘Assign Macro’:

A screenshot of a computer

Description automatically generated

1. And selected ‘CopySelection’ from the ‘Macro Name’ box, clicking ‘OK’ to complete the process:

A screenshot of a computer

Description automatically generated

1. I did the same process to create the macros for the ‘Print’ and ‘Save’ icons as can be seen above.

## Step 11: Creating a Word Document:

1. After creating the macro buttons, I selected the Table and Bar Graph for GDP in my worksheet and used the copy macro to copy the selection:

A screenshot of a computer

Description automatically generated

1. I pasted this into a Word document and added a title to the top of the page as follows:
2. A screenshot of a computer

   Description automatically generated
3. And saved it as ‘Word Gross Domestic Product Report 1’:
4. A screenshot of a computer

   Description automatically generated

## Step 12: Wrapping up the Excel Spreadsheet:

1. Going back to my Excel ‘GDP’ spreadsheet, I selected ‘Page Layout’ from the ‘View’ menu to add a header and footer:

A screenshot of a computer

Description automatically generated

1. I added my name and GLA DATA1 in the header boxes as follows:

A screenshot of a computer

Description automatically generated

1. I then added the date, ‘Assignment 1’ and ‘Data Visualisation to the footer boxes, as follows:

A screenshot of a calendar

Description automatically generated

1. Finally, I returned back to ‘Normal’ view and save my Excel sheet as ‘Excel Gross Domestic Product Report 1’.

# References

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