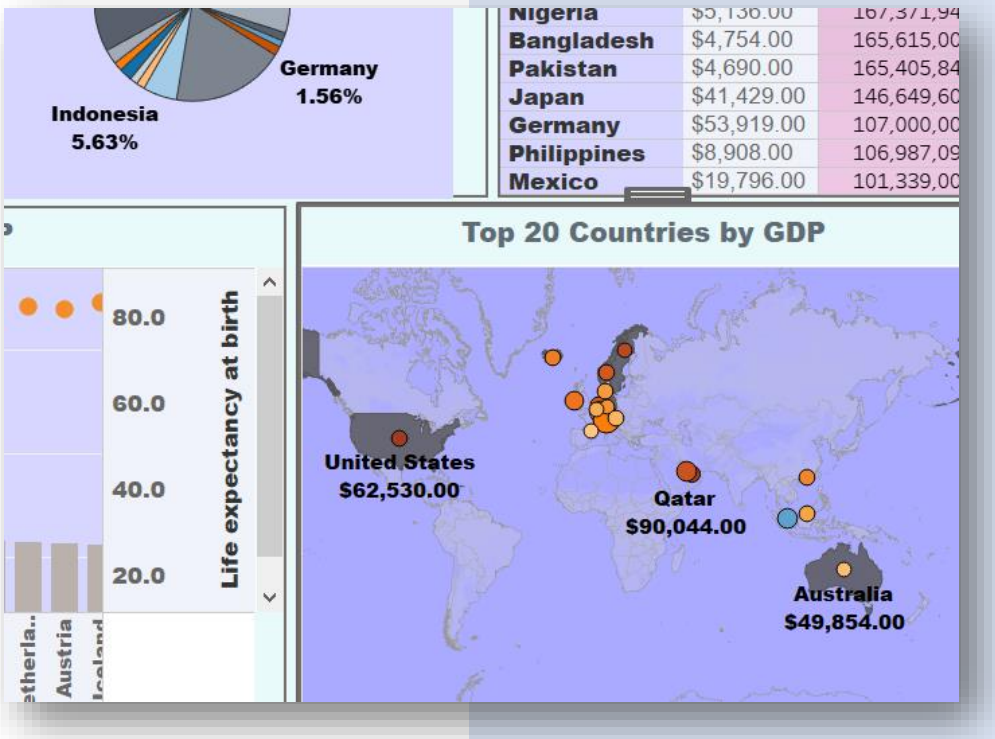
2023



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Cohort: GLA 16

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Contents

List of Figures

The goal is to turn data into information, and information into insight (Fiorina, 2004).

1. Policies and Procedures of Data Management

It is evidential that the role of the data in today's realities has been becoming more and more crucial for further economic and social development. Instigated by technological waves of now 4th Industrial Revolution, large percent of organisations, both in private and public sector generate their organisational strategies, policies, even partnerships, driven by data they have acquired (Hoffman et al., 2019).

Accounting for said above, effective and safe data management and data governance has become one of the key stones for organisational processes and building trustful customer relationships. According to tableau.com (2023), "Data management is the creation and implementation of architectures, policies, and procedures that manage the full data lifecycle needs of an organization". Ways of processing data are also strictly regulated by legislation acts worldwide. For example, European General Data Protection Act (GDPR) of 25th May, 2018, and reinforcing it, UK Data Protection Act of 2018, lay out important security policies, however, also significant penalties for violation of these standards. Seven principles of data mangement highlighted in European GDPR Act range from "lawfulness, fairness and transparency" to integrity and confidentiality" of data processing; from "purpose and storage limitation" to "accountability" associated with having access / working with data. Nevertheless, "consent" of "data subject" – person's, whose information is processed is foremost crucial (GDPR.EU, 2023).

Furthermore, Information Commissioner's Office (IOC) (2023) recommends that organisational rules and policies should govern "data protection by design and by default", setting expectations and methods to meet these expectations to all accountable parties. Therefore, data governance is "the practice of managing how the data that is being managed is processed through the organization". It oversees data ownership, access, security standards, compliance, review and approval of reliability of data sources (Tableau, 2023). As a result of data protection legislation development another new - The Data Governance Act came into force in June 2022 (fully applicable from September 2023.) Purpose of this Act – facilitation of data sharing across industries, sectors and countries (European Commission, 2023).

Finally, data management and governance become increasingly important for handling both public and private data. Though, private requires most attention as personal and sensitive information with extra-limited access to general public. On another hand, public data with open access is important as well, for example, for promoting "transparency and accountability" to various stakeholders. Sources of this type of data are usually public service organisations like National Office of Statistics, but also PLCs (Public Limited Companies), publishing their annual reports (Jain, 2023).

After studying provided data set that will be used in completion of this project, author is mostly certain that it is a public data that it is openly available for wide audience and does not require specific permissions for processing. Although, best practices of data analysis and visualisation should still be used to ensure integrity of results.

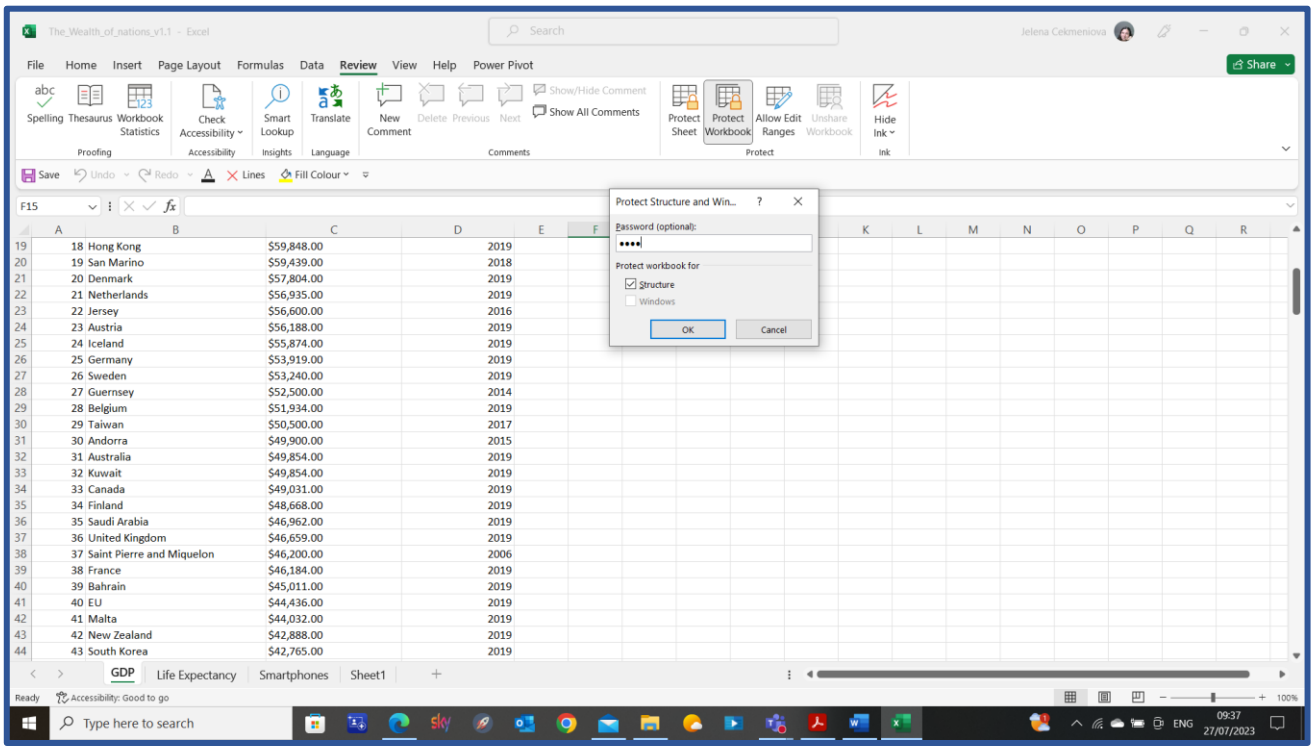
2. Data Analysis and Visualisation Using Excel

2.1 Workbook protection

This task is based on “The Wealth of Nations” Excel data set, using data in GDP sheet only.

The task of data analysis and visualisation in Excel was started from opening above mentioned data set and protecting workbook with the password (Fig. 1), by clicking on “Protect Workbook” in “Review” tab and then creating password. Further, this password could be shared with person, who has appropriate level of access (Schwabish, 2023).

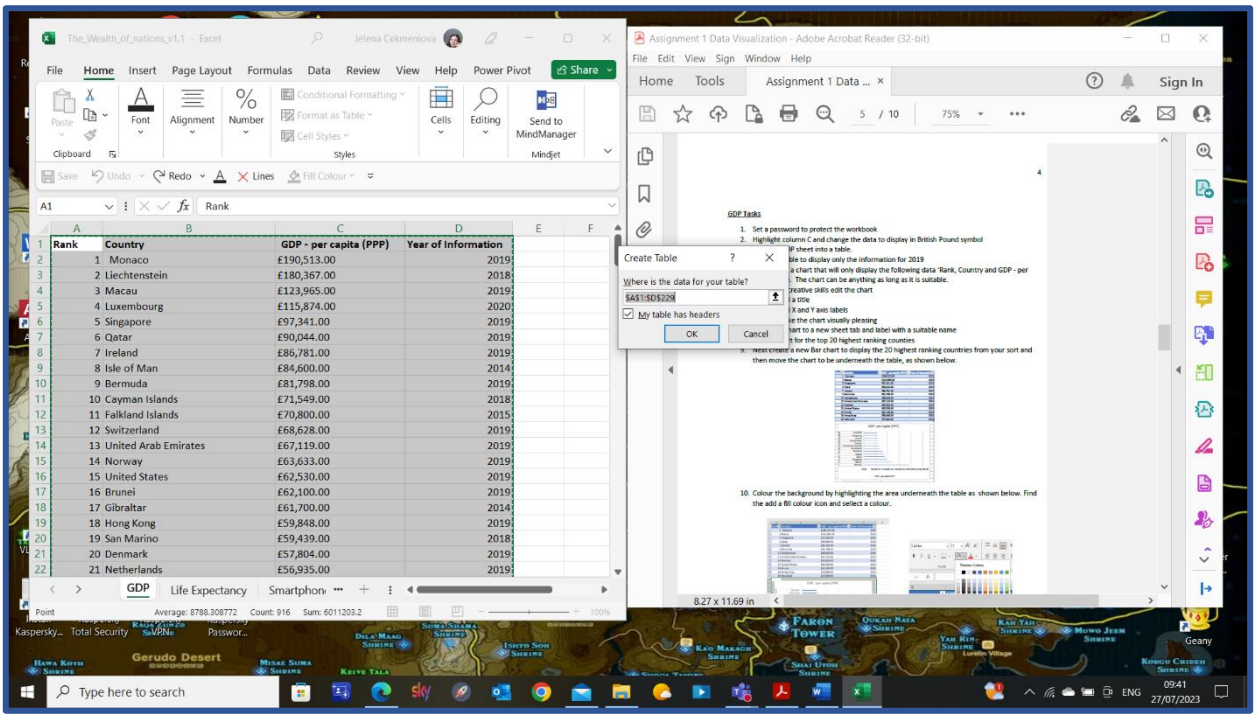
Fig. 1 – Adding Password

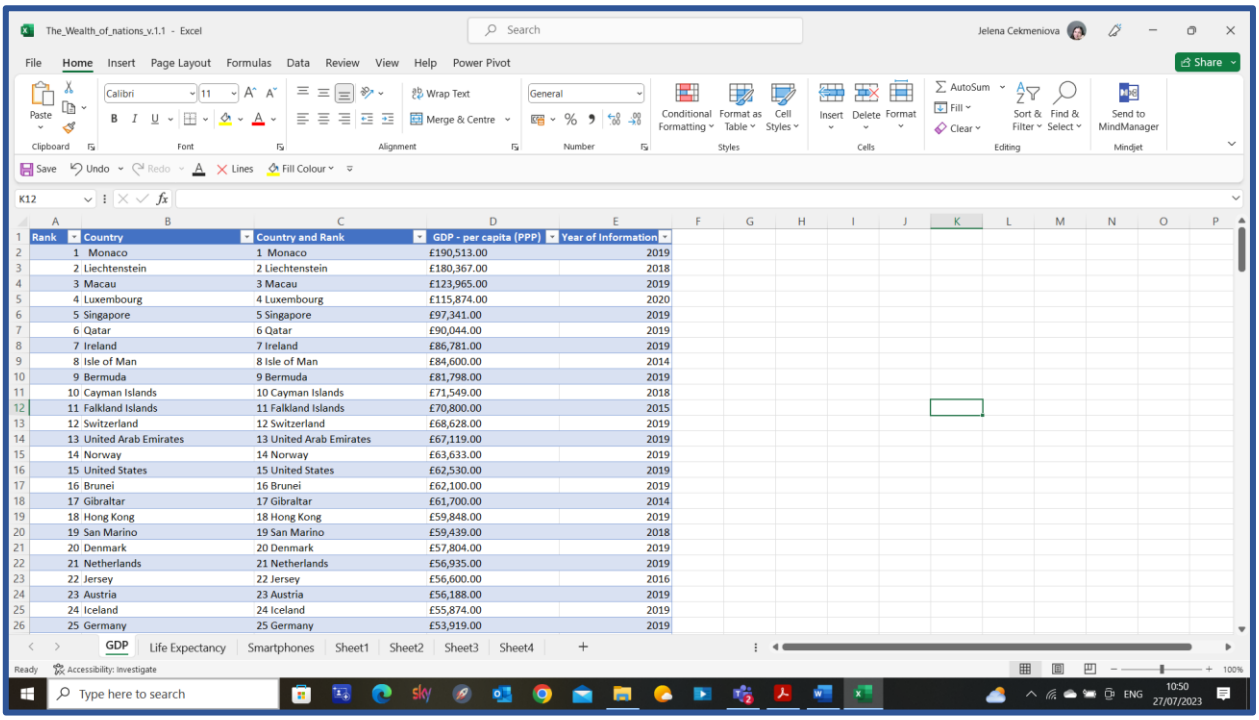


2.2 Converting Data Selection into Table

First, numerical data in “GDP-per capita (PPP)” column was assigned as “currency” with British Pound Sterling sign (“Home” tab – “Number” – “Currency”). Further, for more clear visualisation, data in “Rank” and “Country” columns was concatenated into additional column, “Country and Rank”, to the right (=CONCAT(‘text 1’, “ “, ‘text 2)). Finally, the data in all columns was selected and converted into table (Ctrl+T) (Fig. 2 and Fig. 3).

Fig. 2 and Fig. 3 – Creating Excel Table



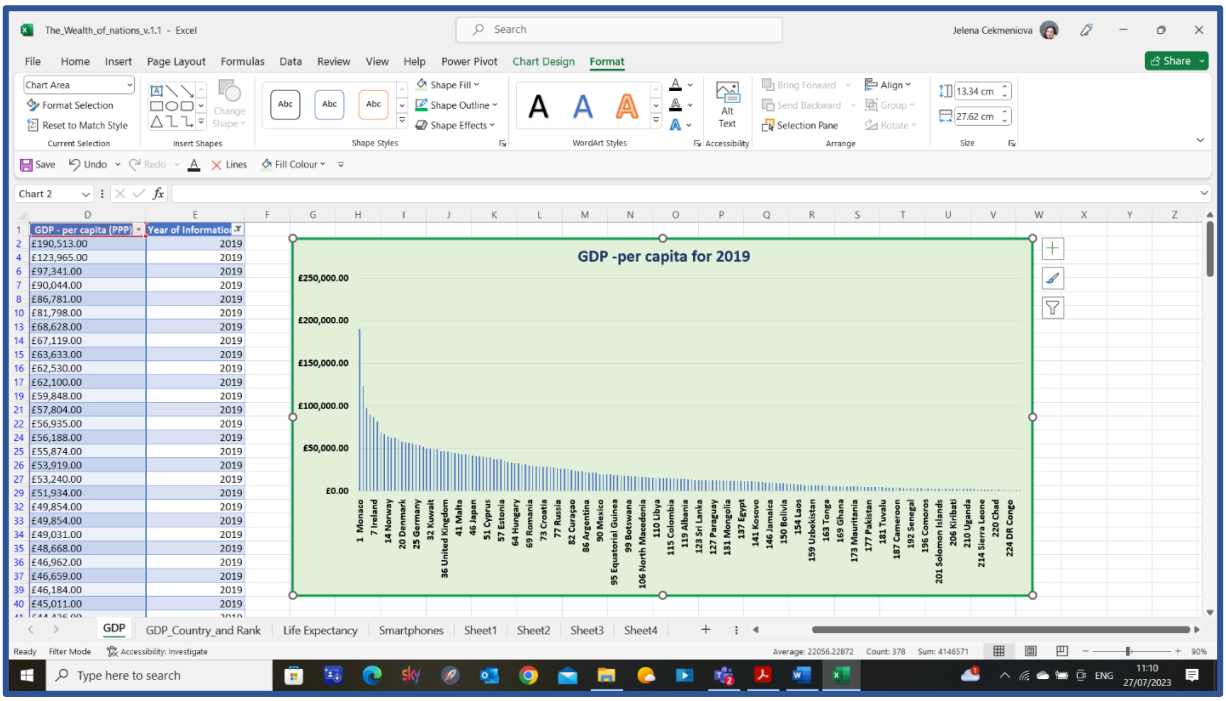


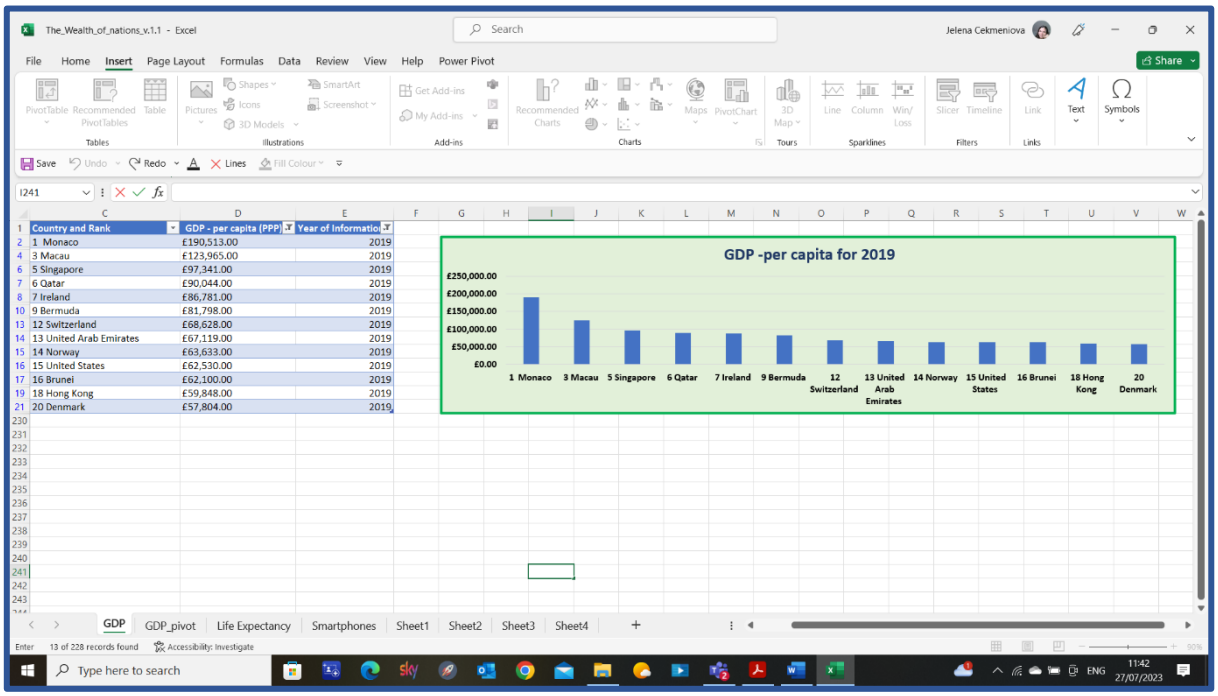
Rank	Country	Country and Rank	GDP - per capita (PPP)	Year of Information
1	Monaco	1 Monaco	£190,513.00	2019
2	Liechtenstein	2 Liechtenstein	£180,367.00	2018
3	Macau	3 Macau	£123,965.00	2019
4	Luxembourg	4 Luxembourg	£115,874.00	2020
5	Singapore	5 Singapore	£97,341.00	2019
6	Qatar	6 Qatar	£90,044.00	2019
7	Ireland	7 Ireland	£86,781.00	2019
8	Isle of Man	8 Isle of Man	£84,600.00	2014
9	Bermuda	9 Bermuda	£81,798.00	2019
10	Cayman Islands	10 Cayman Islands	£71,549.00	2018
11	Falkland Islands	11 Falkland Islands	£70,800.00	2015
12	Switzerland	12 Switzerland	£68,628.00	2019
13	United Arab Emirates	13 United Arab Emirates	£67,119.00	2019
14	Norway	14 Norway	£63,633.00	2019
15	United States	15 United States	£62,530.00	2019
16	Brunei	16 Brunei	£62,100.00	2019
17	Gibraltar	17 Gibraltar	£61,700.00	2014
18	Hong Kong	18 Hong Kong	£59,848.00	2019
19	San Marino	19 San Marino	£59,439.00	2018
20	Denmark	20 Denmark	£57,804.00	2019
21	Netherlands	21 Netherlands	£56,935.00	2019
22	Jersey	22 Jersey	£56,600.00	2016
23	Austria	23 Austria	£56,188.00	2019
24	Iceland	24 Iceland	£55,874.00	2019
25	Germany	25 Germany	£53,919.00	2019

2.3 Creating Filters and Sorting Data

To apply filters, first, from drop-down window in “Year of Information” column, everything was deselected, apart from year 2019. Next filter (Top 20) was applied from drop-down window for “GDP - per capita” column, by selecting “Number Filters” – “Top 10” and adjusting value to 20 (Fig 4 and Fig. 5). Below, it could be seen how bar chart had dynamically changed with applying “Top 20” filter and sorting data in descending order (largest to smallest).

Fig. 4 and Fig. 5 – Filtering and Sorting Data in Fields



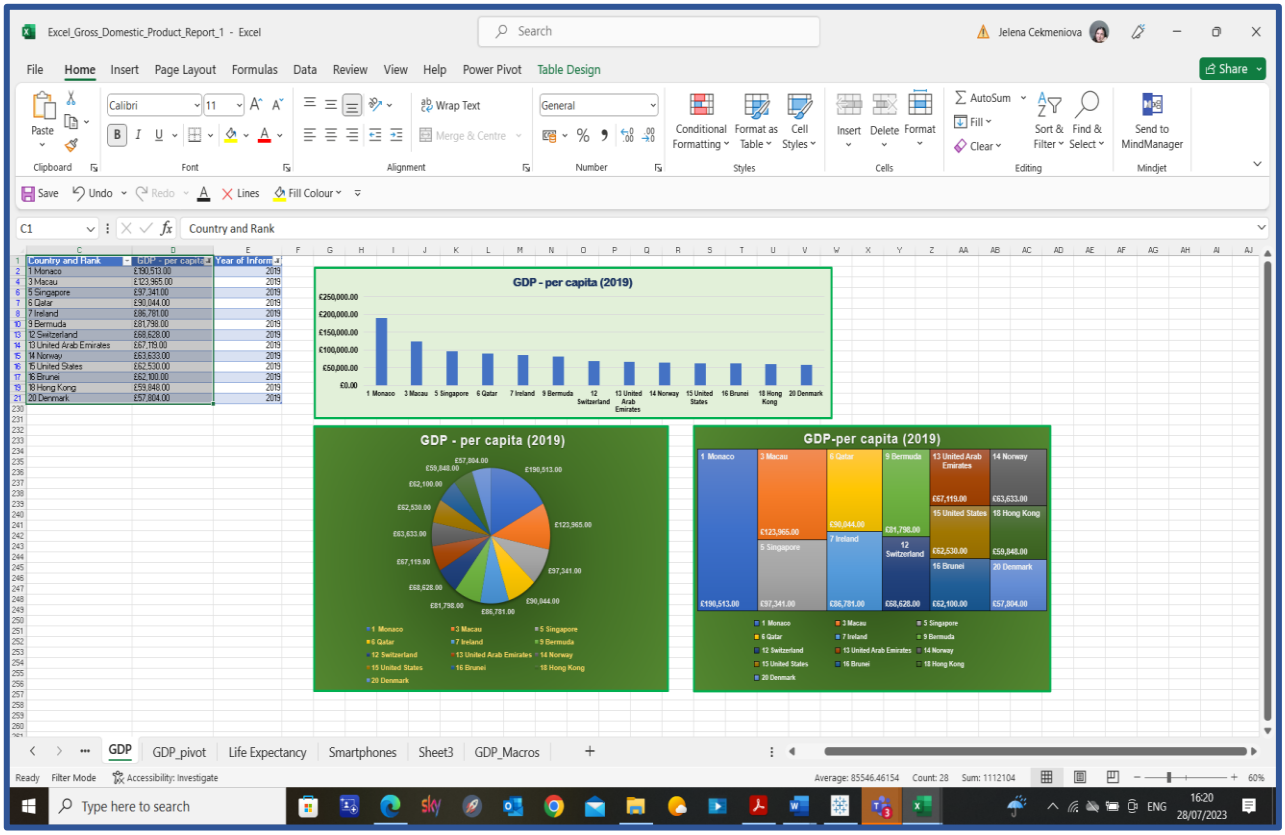


2.4 Creating Graphs and Charts

Author of this project selected to visualise acquired data in three different charts (Bar Chart, Pie Chart and Tree map) (Fig. 6), in order to show, how the same data might be visually represented in different way to suit audience or purpose of presentation (Schwabish, 2023).

Charts were created by selecting appropriate data, “Country and Rank” and “GDP – per capita (PPP), in this case, with further picking from different chart types from “Insert” tab. All charts were edited (i.e., titles, labels, borders, background and axis shading, fonts) for more visually pleasing design, by clicking on chart and using tools in appeared “Chart Design” and “Format” tabs or in pane on right-hand side.

Fig. 6 – Creating Charts



2.5 Macros and Buttons

To improve future usability of Excel work book and quicken repetitive tasks, few macros were recorded and assigned to corresponding buttons (“Print”, “Save”, “Sheet Copy”, “Selection Copy”) (Fig. 7). Images for the buttons’ images created by selecting desired shape from “Illustrations” in “Insert” tab and editing (i.e., colour, size, font, sizing).

Fig. 7 – Buttons for Macros

Macros, themselves, were created by starting recording them ("View"tab – "Macros" – "Record Macro") and completing different steps for different buttons, like printing in PDF file or copying selection to new sheet (Fig. 8). Word of advice – if "Macro Name" consists of more than one word, it should be separated by underscore, rather than empty space, as Excel would generate error message. After steps completed, recording was stopped ("View" tab – "Macros" – "Stop Recording").

Fig. 8 – Recording Macro

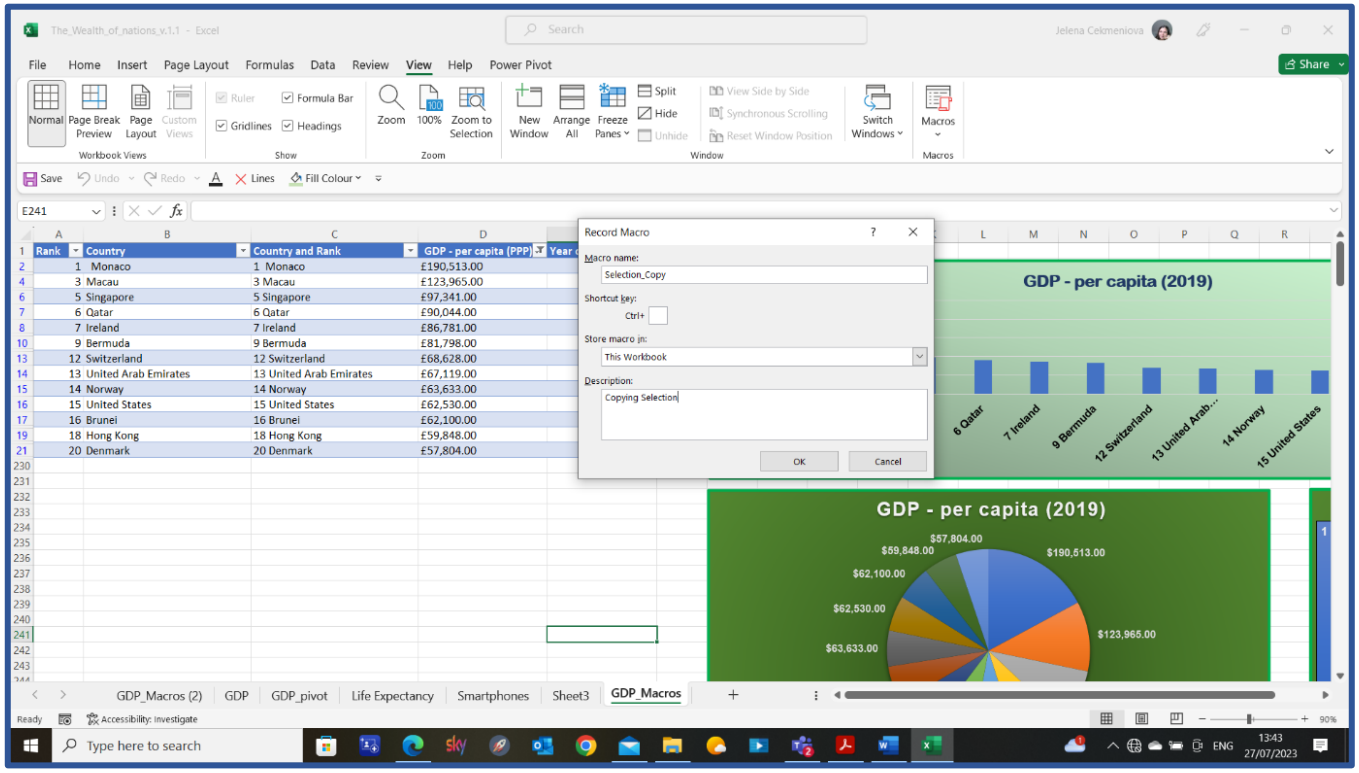


Fig. 9 – Printing to PDF File

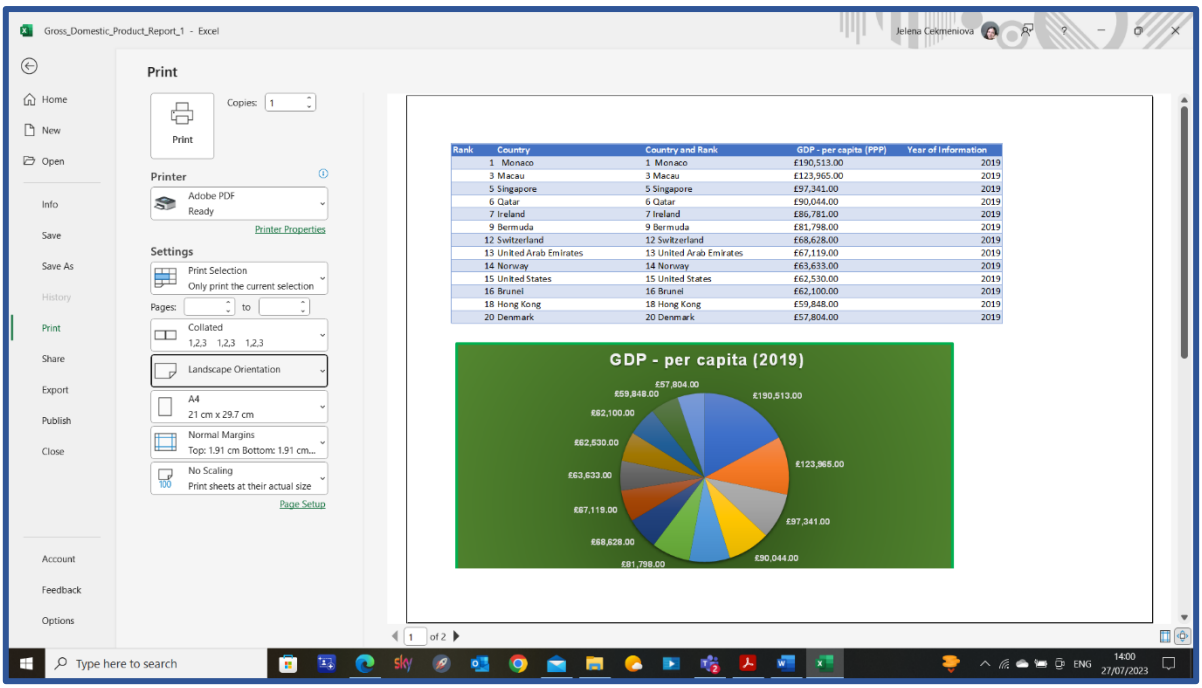
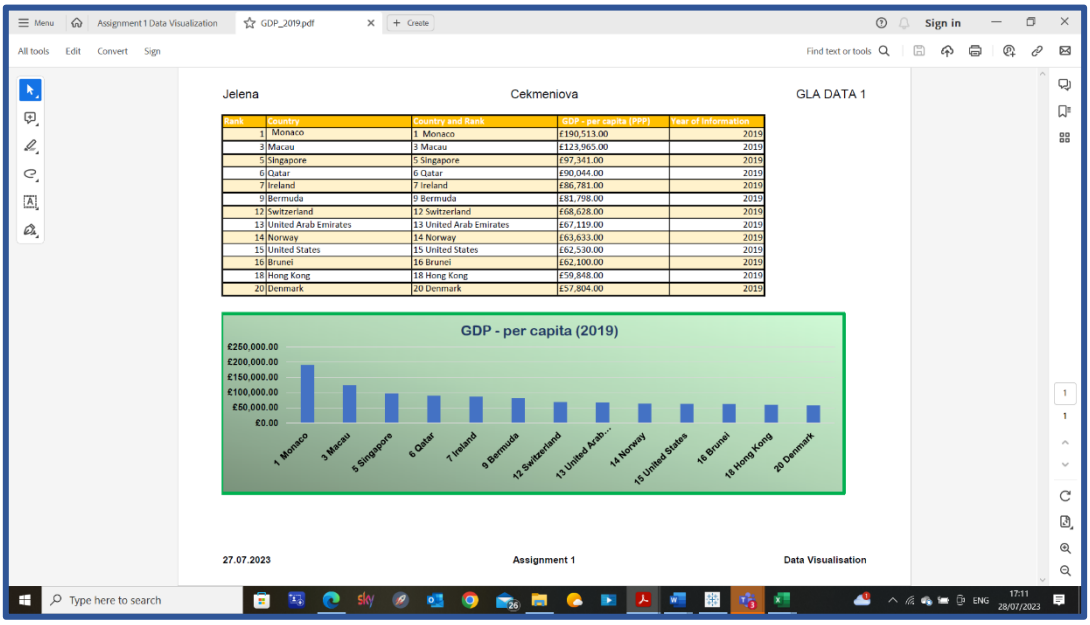


Fig. 9, above, illustrates Printing to PDF task, by making selection of data (i.e., tables, charts) to be printed, moving to “File” tab and then “Print”. Different printing settings might be selected, although, here author decided to chose “Adobe PDF” as a “Printer”, then “Print Selection” and “Landscape Orientation”. There is also option to print entire Excel workbook. These steps would generate PDF file and depending on Adobe PDF Reader settings would open created PDF file in new window (Fig. 10).

Fig. 10 – Excel File Printed to Adobe PDF Reader

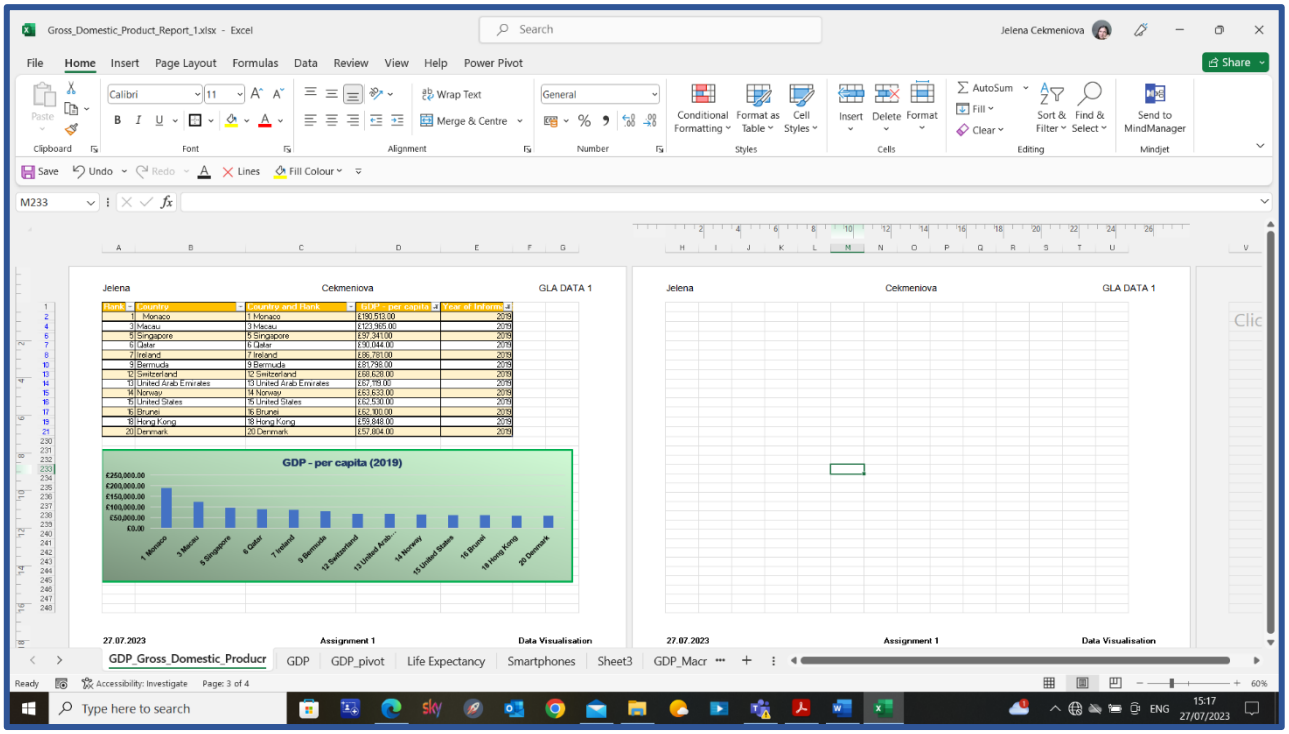


It worth to note that Excel documents need to be saved as macro-enabled type of file for macros to work properly. Last step after macro is recorded is to assign it to corresponding button by right-clicking on it, selecting “Assign Macro” and selecting appropriate macro’s name from the list.

2.6 Adding Header and Footer to the Table

Lastly, to add “Header and Footer”, author made selection of the Excel table and selected “Page Layout”. As a result of this step, header and footer was added throughout whole Excel sheet, dividing it on multiple pages (Fig. 11).

Fig. 11 – Table Header and Footer



3. Data Visualisation with Tableau

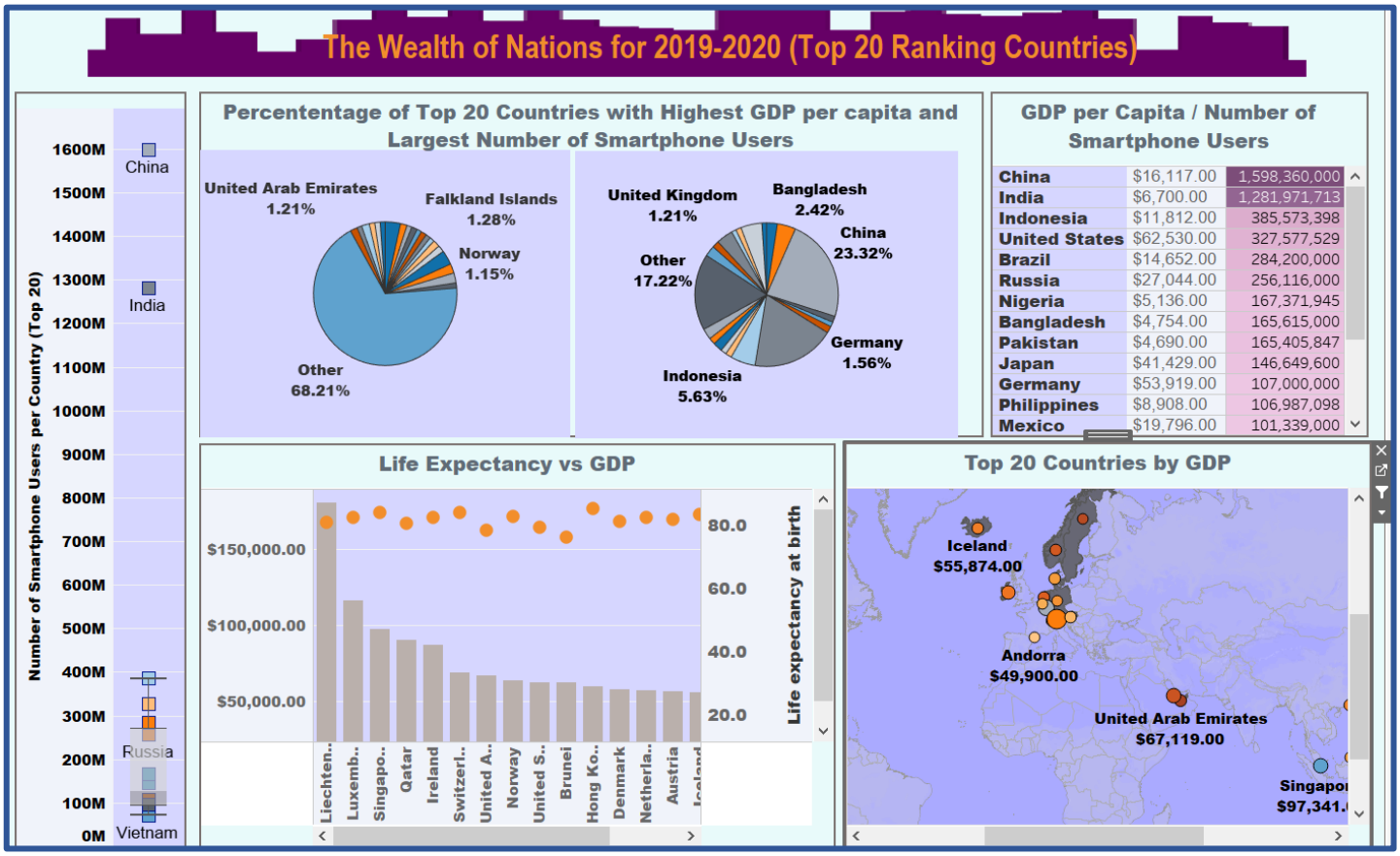
Below Data Visual was created in Tableau on the basis of Excel data set “The Wealth of Nations”. It allows audience to dynamically explore various connections in data for such social concepts as GDP – per capita, Life Expectancy and Number of Smartphone Users worldwide.

As per project requirements, this Tableau dashboard illustrates values for Top 20 Highest Ranking Countries and uses colour-blind-friendly pallets.

Link for the dashboard “The Wealth of Nations for 2019-2020 (Top 20 Highest Ranking Countries)” Tableau Public website:

https://public.tableau.com/views/GDP_vs_Life_Expectancy_and_Number_of_Smartphone_Users/TheWealthofNationsTop20Countries?:language=en-GB&publish=yes&:display_count=n&:origin=viz_share_link

Fig. 12 – Dashboard “The Wealth of Nations for 2019-2020 (Top 20 Highest Ranking Countries)”



4. Reflection

Reflecting back on this project and prior training on beginner to intermediate concepts of Excel and Tableau from JustIT, I definitely have to admit that it was very intense, but rewarding experience. While, I did have some theoretical knowledge of both software applications, practical skills gained through Data Technician Bootcamp, have great add – on value, particular in using Tableau as part of data / business analyst role, which, I ultimately hope to step in.

Refreshing Excel skills on data types, creating pivot tables, using IF and VLOOKUP functions and all this in collaboration with peers and live, very intuitive guidance from tutor was great. However, learning Tableau, and applying it to this project, I found a bit challenging. Some reasons for this:
-Not enough experience with Tableau syntax and appreciation how each step changes what is rendered on the screen;
-Limitations of Tableau itself on what graphs / charts can be used for particular data;
-Inconsistencies in data set, for example, multiple NULL values, which prevents to combine data from multiple tables in efficient way for visualisation. However, I learned good lesson of importance of preparing data thoroughly before importing it to Tableau.

Going forward, to improve my skills of story-telling in Excel and particularly Tableau, I intend to work more in such areas as VBA, Excel and Tableau syntax; calculated fields, graphical / visual design of my dashboards and interactivity / fluency of graphs and charts.

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