Coursework Description Sheet

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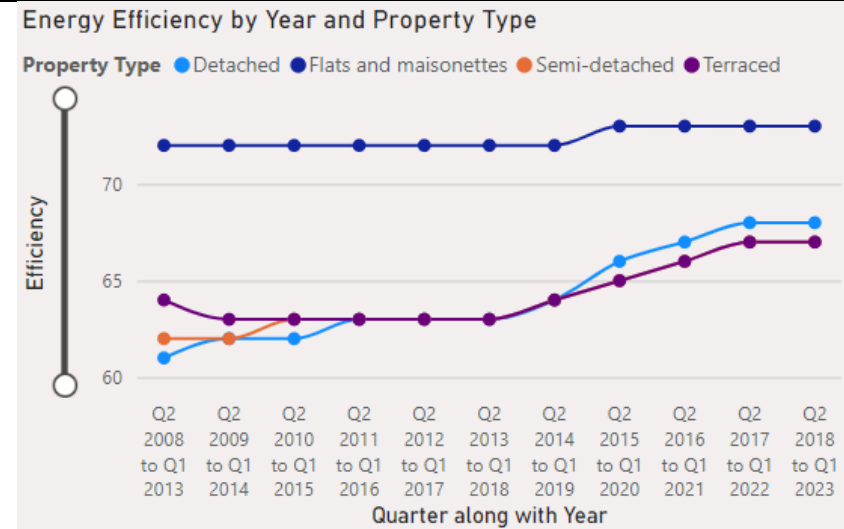
Question	Description	Figure
Fit to Task/User needs		
Location task - How does the visualization allow users to access the spread of carbon dioxide emission across the UK based on the property type?	**Colour-coded map:** It shows Co2 emissions of all dwellings by region code. Provides a quick visual overview of emission levels across different UK regions. **Column chart:** It displays Co2 emissions by region and property type. Each region has four columns representing different property types: a) Detached (light blue) b) Terraced (dark blue) c) Flats and maisonettes (orange) d) Semi-detached (dark red). It allows for detailed comparison of emissions within and across regions. **Median markers**: Red dots on the chart represent the median value of CO2 emissions for each region. Provides a quick reference point for overall emissions in each area.	

Simultaneous comparison:

Users can compare emissions across regions and property types at the same time. It enables identification of patterns or trends in emissions based on both location and dwelling type.

Detailed regional analysis:

Allows users to drill down into specific regions to see how different property types contribute to overall emissions

Property type trends:

Users can observe how emissions from each property type vary across different regions.

Correlation between map and chart:

The colour intensity on the map can be directly related to the height of the columns and position of median markers on the chart. This comprehensive visualization indeed provides users with multiple ways to access and analyse the spread of carbon dioxide emissions across the UK based on both regional and property type factors.

4.73 Average of Detached	
	1.94 Average of Flats and maisonettes
3.72 Average of Semi-detached	
	3.32 Average of Terraced
3.21 Average of All dwellings	

Time task - How does the visualization allow user to understand the evolution of energy efficiency based on the property type, and location?	It allows the user to understand the trends in energy by following means: 1. The x-axis represents quarters, (Q2 2008 to Q2 2018) and allows the user to see the trend over time. 2. Each property type is represented with a different coloured solid line with markers representing the median of efficiency. The properties are Detached: Blue, Flats and maisonettes: Dark Blue, Semi-detached: Orange, Terraced: Dark Purple. It enables the user to compare the trends in efficiency by property type. 3. The y-axis shows the energy efficiency scores, which range from approximately 60 to 75. The location filter is presented as a dropdown in the top right that shows regions listed therein: East Midlands, East of England, England, London, North East, North West, etc 4. It shows, by line graph, how energy efficiency has changed over time for each property type in order to observe trends and patterns. By combining time series data, property type differentiation, and location filtering, this visualization enables users to comprehensively analyse how energy efficiency has evolved across different property types and geographical areas in England over the given time period.	 Country or Region name Slicer

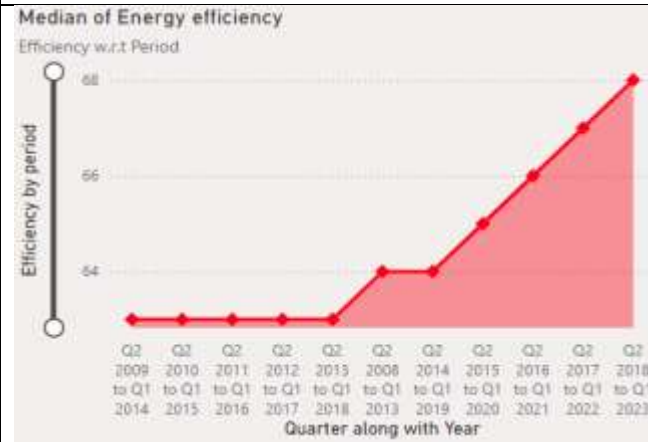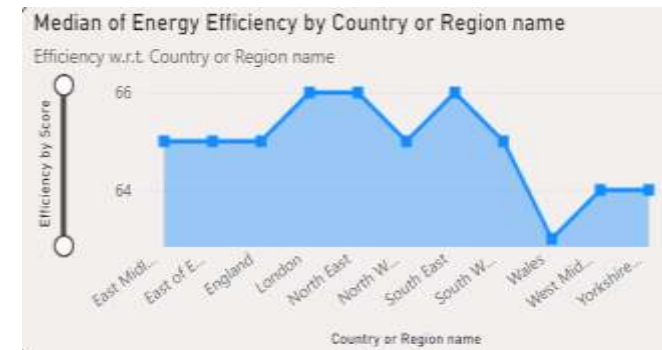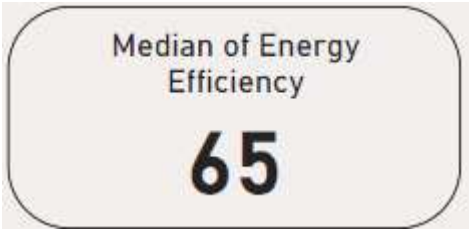|		
Multi-dimensional data task - How does the visualization allow user to identify correlation amongst at least three of the following parameters: property type, tenure, location, energy efficiency, and carbon dioxide emission?	Here is the correlation amongst the three parameters**:** 1. The first graph (Figure 1) shows the median energy efficiency score over time. This allows users to see the overall trend in energy efficiency, which has been increasing steadily. 2.The panel (Figure 2) shows three tenure types: Owner-occupied, Private rent and social rent and the below card shows the median of energy efficiency. 3. The third graph (Figure 3) displays median of energy efficiency values by country or region name. This allows users to compare energy efficiency across different geographical areas in the UK. 4. By looking at the first graph (Figure 1), users can see correlation between Time and Efficiency, how energy efficiency has changed over time, identifying a positive correlation between passing years and increasing efficiency scores. **Correlation between Location and Efficiency**: The third graph (Figure 3) enables users to identify how	 Figure 1 Figure 2 Figure 3

	energy efficiency varies by location. For instance, London appears to have the highest median efficiency score, while Wales has the lowest. **Potential Correlation with Tenure:** While not directly graphed, the inclusion of tenure types allows users to consider how these might correlate with the efficiency scores shown in the other graphs. For example, users might hypothesize about how different tenure types might be distributed across regions and how this could impact regional efficiency scores. **Overall Median Efficiency:** The central number (65) provides an overall median energy efficiency score, which can be used as a reference point when analysing the other data.	Median of Energy Efficiency **65**
Visualization Principles		
Use of colour - How does the use of color in this dashboard enhance the readability and effectiveness of the data presentation?	In this dashboard, colours have been used to enhance both readability and effectiveness. Several ways these are used include: 1. **Consistency across visualizations:** Similar colour schemes are used across various charts so that the user can have ease of recognition and comparison of data points.	

	2. **Differentiation in property type:** We can see colour coded different types of properties in the chart "Energy Efficiency by Year and Property Type": Blue for Detached, Dark Blue for Flats and maisonettes, Orange for Semi-detached, and Purple for Terraced. This allows for quick and easy visual separation of each represented data type. **3. Regional CO2 emissions map:** The map uses a colour gradient (lighter to darker shades) to represent CO2 emissions by region, providing an intuitive geographical overview.	
Use of graphic design principles -How does the application of graphic design principles enhance the clarity and effectiveness of the data presentation in this dashboard?	This dashboard shows how effectively clear data presentation can be done through the application of the principles of graphic design, and is demonstrated through the following: **Simplicity**: Clean design with few or no decorative elements maintains focus on the data. **Consistency**: Charts and graphics are stylized in a consistent manner for a consistent feel. **Hierarchy:** Key metrics are displayed at the top, guiding the viewer's attention. **Alignment**: Straight alignment of	

	elements creates an organized, structured layout. **Colour coding:** Consistent colour scheme helps to contrast and compare data categories.	
Use of interaction - How does the use of interactive design elements improve the user's ability to explore and interpret data on this dashboard?	These interactive design elements within the dashboard enable the user to explore data and draw interpretations thereof in more ways than one, including: **Dropdown menu:** There is a button called "All" dropdown on the top right of the "Energy Efficiency by Year and Property Type" chart would likely permit users to filter data by specific regions or country name types. **Hover Effects:** The user can hover on any of the column chart or line chart or map to view the corresponding data. **Filtering options**: The "Tenure" section implies the ability to filter data based on occupancy type. **Time series navigation**: The quarterly breakdown in the "Median of Energy efficiency" chart suggests users can explore trends over time.	
Use of text and legend - How do the use of text and legends contribute to the clarity and user comprehension of the	The use of text and legends in this dashboard contributes to clarity and user comprehension in various ways:	

data presented in this dashboard?	**1.Clear title**: "ENERGY EFFICIENCY ACROSS UK" immediately conveys the dashboard's purpose. **2.Brief labels**: Each chart has a clear, descriptive title explaining what data it represents. **3.Consistent labelling**: Property types are consistently labelled across charts (e.g., "Detached", "Flats and maisonettes"). **4.Color-coded legends**: Charts use color-coded legends to distinguish between different data categories. **5. Time period indicators**: Charts showing trends over time clearly label the time periods. **6.Region names:** The map and charts include region names for geographical context. **7. Tenure types:** A separate legend explains different tenure types.	

References

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- *Aigner, W., Miksch, S., Schumann, H., & Tominski, C. (2011). Visualization of Time-Oriented Data. Springer*
- *Munzner, T. (2014). Visualization Analysis and Design. CRC Press.*
- *Evergreen, S. D. (2019). Effective Data Visualization: The Right Chart for the Right Data. SAGE Publications.*