

AAE718_Hw3

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Problem 02

The calculated difference `Result of methane_aggregation` is 8851.337519429624. This result indicates a significant discrepancy between the total agricultural emissions reported under the “World” category and the sum of agricultural emissions reported by all other regions. The “World” category may include agricultural emission data from certain regions that are not reported in detail, or some regional emissions may have been double-counted. Such inconsistencies in classification can lead to differences between the global total and the sum of regional totals. Different countries and regions may adopt different data collection and reporting methods, resulting in biases during the aggregation process. Agricultural emissions can vary significantly depending on the type and intensity of agricultural activities in different regions. Some regions may not fully record all agricultural activities’ emissions, especially those from scattered or small-scale agricultural activities, which can also contribute to discrepancies in statistical data. Errors in data collection, processing, and aggregation may occur, and mistakes in data entry and calculations can lead to discrepancies between the global total and regional totals as these errors are further amplified during data aggregation.

There may be significant differences in how developing and developed countries record and report agricultural emissions. Developing countries might have less comprehensive and accurate agricultural emission records due to technological and resource limitations, while developed countries may have more sophisticated recording and reporting systems. Additionally, advanced agricultural technologies and management practices in developed countries may lead to different emission levels.

Problem 04

Region	Emissions
Africa	133.490524
Asia Pacific	658.146709
Central and South America	249.398851
Europe	162.943698
Middle East	203.720849
North America	1038.482118
Other	761.778913
Russia & Caspian	650.225129
World	22234.196225

Table 1: Region Averages DataFrame

Problem 05

Region	Emissions
Africa	288.233898
Asia Pacific	2126.242593
Central and South America	798.267230
Europe	587.868324
Middle East	454.695559
North America	3537.337588
Other	3394.119278
Russia & Caspian	1787.937768
World	88950.333740

Table 2: Region Total Averages DataFrame

Aggregated Data Effect: The significant difference between the two tables highlights the impact of aggregated data on regional averages. When only 'Total' segments are considered, the average emissions per region are much higher, reflecting the overall emissions more accurately.

Data Specificity: Including all segments in the first table gives a more detailed but less impactful view, as smaller segments dilute the average emissions values.

Implications for Policy and Analysis: When analyzing emissions data for policy-making or environmental studies, it's crucial to differentiate between specific segments and aggregated totals. Aggregated data provides a clearer picture of the overall emissions burden, which is essential for setting targets and measuring progress.

Discrepancies in Data: The discrepancies between the two tables could also indicate variations in how data is reported and categorized across different regions. This variation needs to be considered when comparing regions to ensure a fair and accurate analysis.

Problem 06

Aggregated by region

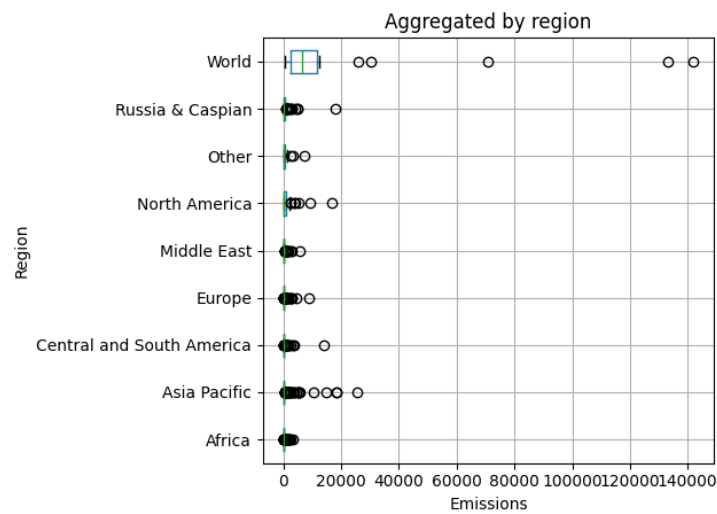


Figure 1: Aggregated by region

Discussion: This box plot shows the emissions distribution across different regions, with the "World" region showing significantly higher emissions compared to others, indicating it includes global totals.

Aggregated by region, excluding World

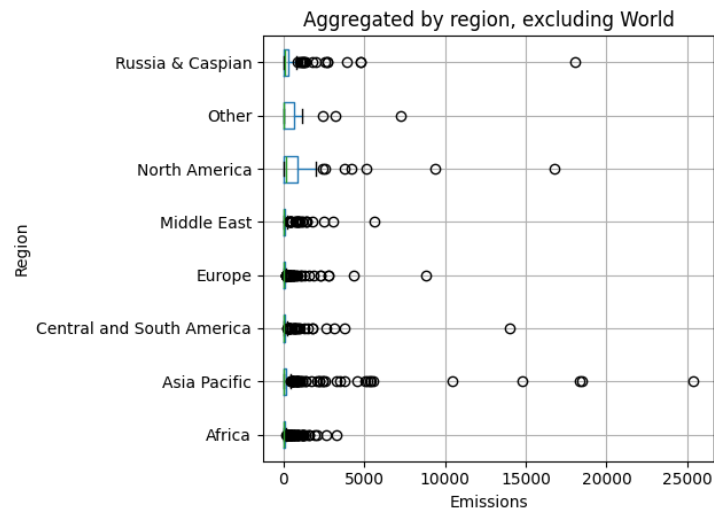


Figure 2: Aggregated by region, excluding World

Discussion: By excluding the "World" region, the plot provides a clearer view of emissions distribution among individual regions, highlighting significant variability, particularly high emissions in North America and Asia Pacific.

Aggregated by region, excluding World and only including Total

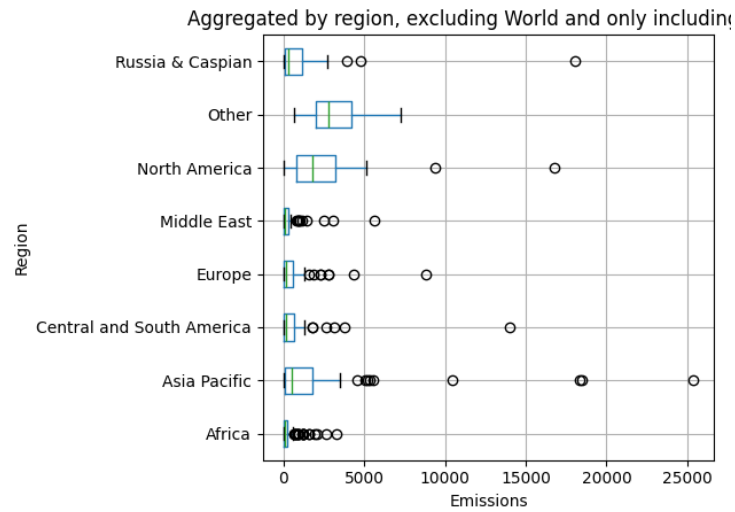


Figure 3: Aggregated by region, excluding World and only including Total

Discussion: Focusing only on the "Total" segment further refines the view, showing that North America and Asia Pacific have notably higher total emissions compared to other regions.

Aggregated by segment, excluding World and Total

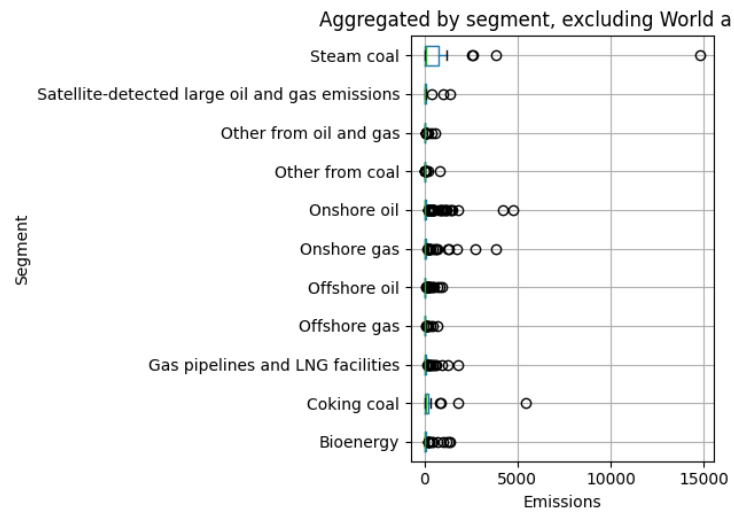


Figure 4: Aggregated by segment, excluding World and Total

Discussion: This plot reveals the distribution of emissions by different segments, with segments like "Steam coal" and "Satellite-detected large oil and gas emissions" showing higher emissions and variability.

Aggregated by type

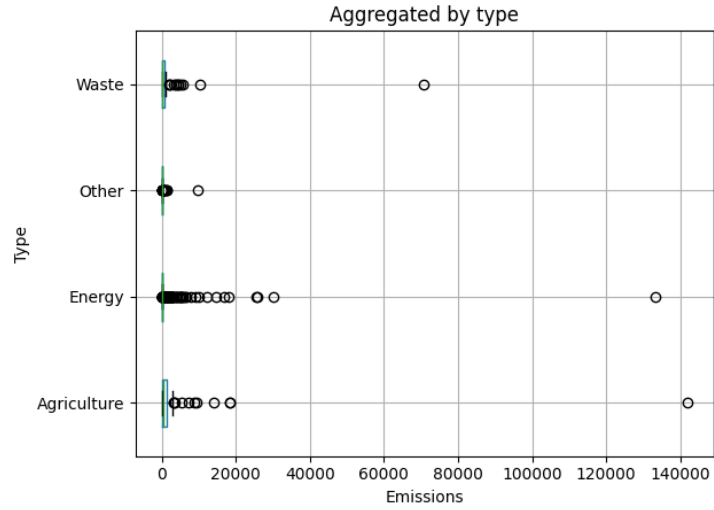


Figure 5: Aggregated by type

Discussion: Emissions aggregated by type illustrate that "Energy" and "Agriculture" have more dispersed and higher emissions compared to other types like "Waste" and "Other," highlighting the significant contributions of these sectors to overall emissions.

Problem 07

Column Name	Description and Observation
Name	The name of the accessory item. Provides a unique identifier for each accessory, allowing players to easily recognize and reference items.
Variation	Different variations of the same accessory (e.g., different colors or patterns). Offers customization options, letting players choose their preferred style.
DIY	Indicates whether the accessory can be crafted by the player (Do It Yourself). Helps players identify items that can be made using DIY recipes, rather than purchased.
Buy	The purchase price of the accessory in the in-game currency (bells). Allows players to plan their in-game finances and prioritize purchases.

Sell	The selling price of the accessory in bells. Helps players determine the resale value of items, useful for managing their inventory and making profits.
Color 1, Color 2	The primary and secondary colors of the accessory. Useful for players who want to match accessories with their outfits or decor.
Size	The size of the accessory. Provides information about the space an accessory might occupy, relevant for items placed in the player's home.
Miles Price	The price of the accessory in Nook Miles, another in-game currency. Important for players who are managing both bells and Nook Miles.
Source	How the accessory can be obtained (e.g., shop, crafting, event). Guides players on where or how to find each accessory.
Source Notes	Additional details about obtaining the accessory. Provides extra context or conditions needed to acquire the item.
Seasonal Availability	The time of year or season when the accessory is available. Helps players know the best times to look for specific accessories.
Mannequin Piece	Indicates if the item can be used on mannequins. Useful for players organizing fashion displays.
Version	The game version in which the accessory was introduced or modified. Helps players keep track of updates and new additions to the game.
Style	The style category of the accessory (e.g., Cute, Sporty). Assists players in matching accessories with their preferred fashion style.
Label Themes	The themes associated with the accessory, used by the character Label. Relevant for completing fashion challenges set by Label.
Type	The type of accessory (e.g., Hat, Glasses). Helps in categorizing and filtering accessories based on their type.
Villager Equippable	Indicates if villagers can equip the accessory. Useful for gifting items to villagers.
Catalog	Indicates if the item is available in the player's catalog for reorder. Important for players who want to repurchase items.
Filename	The internal filename used by the game. Likely of less interest to players, but important for data management.
Internal ID	The internal ID used by the game. Useful for game developers or advanced users.
Unique Entry ID	A unique identifier for each entry. Ensures each accessory has a distinct identifier, helpful for database management.

Problem 08

The item with the largest sell price is: **Nook Inc. eye mask**

Problem 09

Item with the smallest difference between buy and sell price:**bandage**