**CP2403/CP3413: Assignment – Part 1 – 15% - Answer Template**

**Data Exploration, Management & Visualization**

**Due: Friday of Week 6, 11:59pm**

First Name:

Last Name:

Task 1: Histogram

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| Investigative Question: What is the frequency distribution of water temperatures recorded in the dataset?  quantitative variable: Temperature (T\_degC) |

What is conclusion can you draw from the histogram?

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| The histogram displaying water temperatures indicates that the majority of recorded values fall within the range of 0 to 30 degrees Celsius. However, there are very few instances beyond this range. The distribution exhibits a right-skewed pattern, signifying that higher temperatures are less frequently observed compared to lower temperatures in the sampled water. |

Task 2:Box plot

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| Investigative Question: How does the temperature of water vary across different salinity categories?  categorical variable: Salinity Category  quantitative variable: Temperature (°C) |

What is conclusion can you draw from the box plot?

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| The box plot displaying temperature variations across salinity categories demonstrates that the 'Low' and 'Very High' salinity categories do not show significant variability in water temperature. However, the 'Moderate' salinity category exhibits notable temperature variability, with the median temperature (Q2) around 10°C (Q1 ~8°C, Q3 ~15°C). The highest recorded temperature in this category is around 19°C, while the lowest is approximately 6°C. Additionally, no outliers are observed within these salinity categories based on the temperature data. |

Task 3: Line chart

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| Investigative question: How does water temperature change concerning different depths in the sampled seawater?  quantitative variable: Temperature (°C). |

What is conclusion can you draw from the line chart?

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| The line chart illustrating the variation of water temperature concerning different depths indicates fluctuations in temperature across the sampled depths. Most temperature values fall between 5 and 30 degrees Celsius across depths ranging from 0 to 5000 meters. However, the plot showcases a drastic temperature decrease from around 30 degrees to lower temperatures as the depth increases, suggesting a correlation between depth and temperature variations. This pattern highlights the change in water temperature concerning increasing depths in the sampled seawater. |

Task 4: Bubble.

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| Investigative Question: How do temperature, depth, and salinity relate to each other in the sampled seawater?  quantitative variable 1: Temperature (°C)  quantitative variable 2: Depth (meters)  quantitative variable 3: Salinity |

What is conclusion can you draw from the bubble chart?

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| The bubble chart visualizes the relationship between temperature, depth, and salinity in the sampled seawater. It reveals that temperatures between 5 and 25 degrees Celsius predominantly occur within the range of salinity values from 34 to 36. This range appears to be where most temperature variations are concentrated across different depths, suggesting a correlation between temperature and salinity within this specific salinity range. The bubble sizes could indicate the variability or concentration of oxygen levels, showing potential interactions between temperature, salinity, and oxygen at different depths in the sampled seawater. |

Task 5: Selected Chart.

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| Selected Chart:  Investigative Question: How do oxygen levels and salinity relate to depth in the sampled seawater?  Variables used  Variable 1: Depth (meters)  Variable 2: Oxygen (mL/L)  Variable 3: Salinity |

What is conclusion can you draw from your selected chart?

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| The scatter plot visualizes the relationship between depth, oxygen levels, and salinity in the sampled seawater. It demonstrates that oxygen levels are notably concentrated around 0 mL/L, especially within the range of 0 to 1000 meters depth. Besides, at greater depths beyond 500 meters, there's a shift in salinity, notably increasing and maintaining a range between 32 to 36, while oxygen levels remain relatively low. The plot highlights how oxygen levels vary concerning depth and salinity in the sampled seawater, showcasing potential correlations and patterns within these variables. |