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**2020070**

**Problem 1**

Chart, waterfall chart

Description automatically generated

**Chart, funnel chart

Description automatically generated**

We may notice underestimated and overstated values in the graph above. The bar graph for underestimated values is negative, while the bar graph for overestimated values is positive. Color value is the one that people underestimated, whereas slope and volume are the ones that people overestimated. Divergent color vividly demonstrates this graphical style; as the color darkens, it indicates that these numbers are significantly underestimated or overestimated. Underestimated data are Angle, Color Value, Length, Vertical Distance whereas Overestimated data are Area, Slope, and Volume.

Chart, box and whisker chart

Description automatically generated

A picture containing shape

Description automatically generated

The following graph shows how the differences between tests and trials are conveyed using color. Vertical distance had the lowest absolute error when aligned, which means it had the smallest percentage difference when the students predicted their answers. Slope and color value had the highest absolute inaccuracy.

1. Density versus Response

Chart

Description automatically generated

We can see that the red display has a high value, but it is not stable, and it changes a lot. While the responses in the second display are modest in value and exhibit little fluctuation, they are more stable.

**Chart, scatter chart

Description automatically generated Chart, scatter chart

Description automatically generated**

**Problem 2**

1. **Messier number Vs Size**

Chart, scatter chart

Description automatically generatedThe messy numbers vs. size indicate that most of the data points ranged in size from 0 to 30, with some data points beyond that range.

**Messier Number vs Distance**

Chart, scatter chart

Description automatically generatedThe messier distance numbers imply that the galaxy has the greatest distance, which ranges between 6 and 8. The rest of the species, on the other hand, stayed within a range of 0 to 4.

Chart

Description automatically generated

The distribution of distances to items in each Kind using a violin plot. The Globular Cluster and Star Cloud have no dispersion in this graph, whereas the others have different forms and sizes, allowing for greater interpretability.

**Chart, scatter chart

Description automatically generated**

The graph above depicts the distance to the apparent magnitude. The greater the distance, the less noticeable the things are.

Chart, bubble chart

Description automatically generated

The graph below shows the Log10(Distance) vs. Apparent magnitude as well as a representation of their size using the size variable to indicate the angular size of the objects. Increasing the point size to make it more readable.

**Problem 3**

**Chart, line chart

Description automatically generated**

We can see population growth from 1890 to 2000. The greatest expansion occurred between 1890 and 1900, 1900 and 1910, and 1910 and 1920. After 1920, it decreased, then varied "consistently" until 2000, when it began to rise. Overall, the data shows a 5x increase from 1890 to 2000.

**Chart, line chart

Description automatically generated**

The population rate of change climbed significantly in the first three decades leading up to 1920, when it had the greatest population rate fall. From then on, the population rate fluctuated "consistently" till 2000, when it began to increase again.

1. The population percentage increase greater than 15% was: 1890 to 1900,1900 to 1910 and 1920 to 1920.

**Problem 4**

1. Scatterplot to look at the relationship between Wind and Solar radiation

Chart, scatter chart

Description automatically generated

From the above graph we can see the scatter plot between wind and solar radiation. The y-intercept starts approx. to 200 and slopes has negative direction.

Chart, box and whisker chart

Description automatically generated

Chart, box and whisker chart

Description automatically generated

The box plot with jitter enabling the user to better understand the distribution of the data and there are some outliers in the ozone layer.

1. We can see the wind and solar radiation in the QQ-Plot.

Chart, scatter chart

Description automatically generated