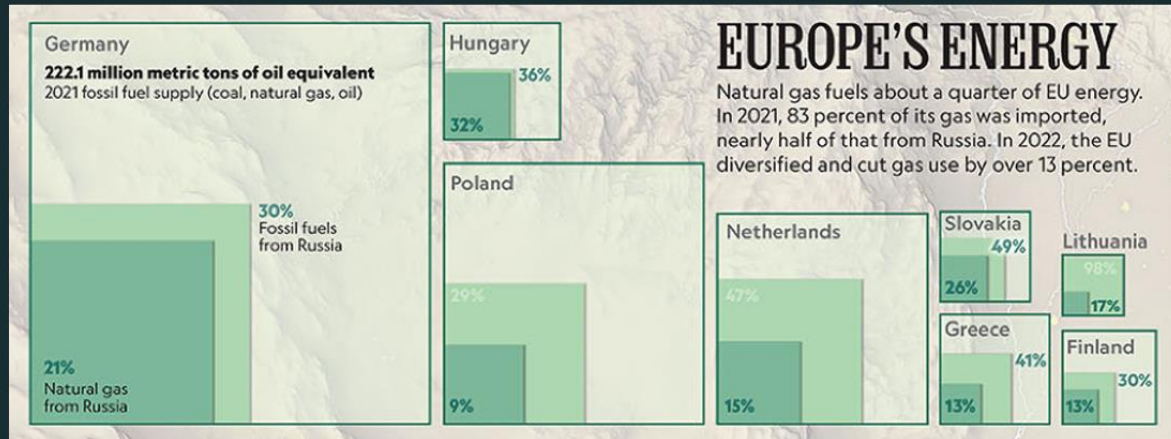


This chart was placed on a map created by the National Geographic Magazine.



Which of the following statements are correct?

*Note: Select all correct answers. Incorrect choices will be penalised.*

- ☐ a. In a bar chart or a stacked bar chart the values would be easier to compare.
- ☐ b. The area channel is used for a quantitative attribute.
- ☐ c. The hue channel is used for a nominal attribute.

Which of the following attributes are **not** suitable to be encoded with the **Shape** visual channel?

*Note: Please select all correct answers. Incorrect choices will be penalised.*

- ☐ a. The citizenship attribute from an employee dataset
- ☐ b. The gender attribute from a student dataset
- ☒ c. The height attribute from a student dataset
- ☒ d. The price attribute from a property dataset

The horizon graph idiom is a variation of the line chart idiom, which can visualise time series data with much less space than line charts. The following graphs (Steps 1-4) present how a horizon graph is created.

Consider the final visualisation (Step 4) of this particular horizon graph.

Please select all the channels used in this visualisation.

*Note: Please select all correct answers. Incorrect choices will be penalised.*

Step 1 - Create a line chart (figure below).



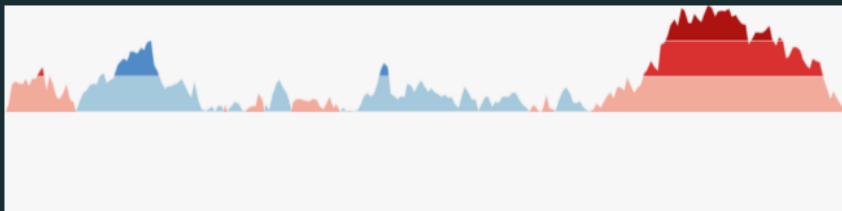
Step 2. Use variations in colour to make patterns and exceptions more visible (Figure below).



Step 3. Display increases and decreases in value in a shared vertical space (Figure below).



Step 3. Display increases and decreases in value in a shared vertical space (Figure below).



Step 4. Collapse the colour bands to display the values in less vertical space (Figure below).



[Source of all figures: [http://www.perceptualedge.com/articles/visual\\_business\\_intelligence/time\\_on\\_the\\_horizon.pdf](http://www.perceptualedge.com/articles/visual_business_intelligence/time_on_the_horizon.pdf)]

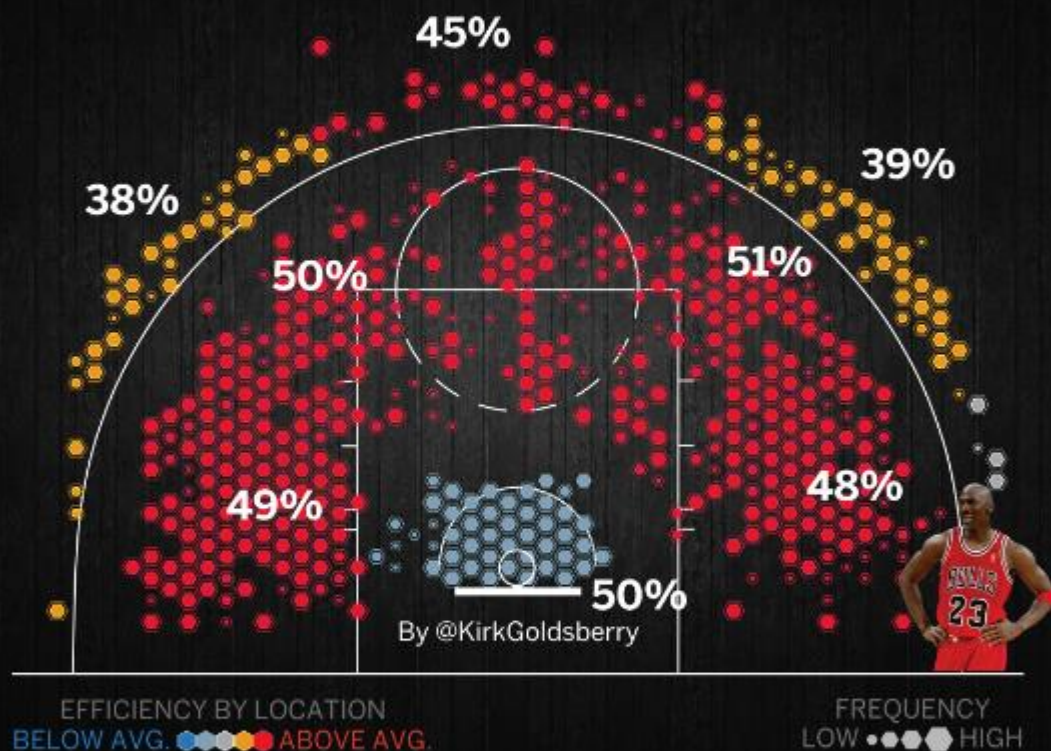
- ☐ a. Texture
- ☒ b. Area
- ☒ c. Position
- ☐ d. Colour saturation and/or luminance
- ☐ e. Shape
- ☒ f. Colour Hue
- ☐ g. Length

The following visualisation studies Michael Jordan's scoring data. What is(are) the dataset type(s) used for creating this visualisation?

Note: Please select all correct answers. Incorrect choices will be penalised.

## Michael Jordan, 1996-97

The best midrange scorer on the planet



Source: [https://www.espn.com/nba/story/\\_/id/29035071/why-michael-jordan-scoring-prowess-touched](https://www.espn.com/nba/story/_/id/29035071/why-michael-jordan-scoring-prowess-touched)

- ☐ a. Network
- ☐ b. Map
- ☐ c. Relative scores
- ☐ d. Quantitative attribute
- ☐ e. Table
- ☐ f. Field
- ☐ g. Tree

In visualisation design, "the most important attributes should be encoded with the most effective visual channels in order to be most noticeable, and then decreasingly important attributes can be matched with less effective channels" (unit textbook by Tamara Munzner, 2014, p 101).

Suppose that we use a scatter plot (or bubble chart) to visualise the covid-19 dataset below. Each point represents a country; the colour hue is used to represent "Continent". The importance ranks of the attributes that we would like to visualise are: "Active (cases)" > "Deaths" > "Confirmed (cases)".

Which of the following visualisation designs is(are) the most effective?

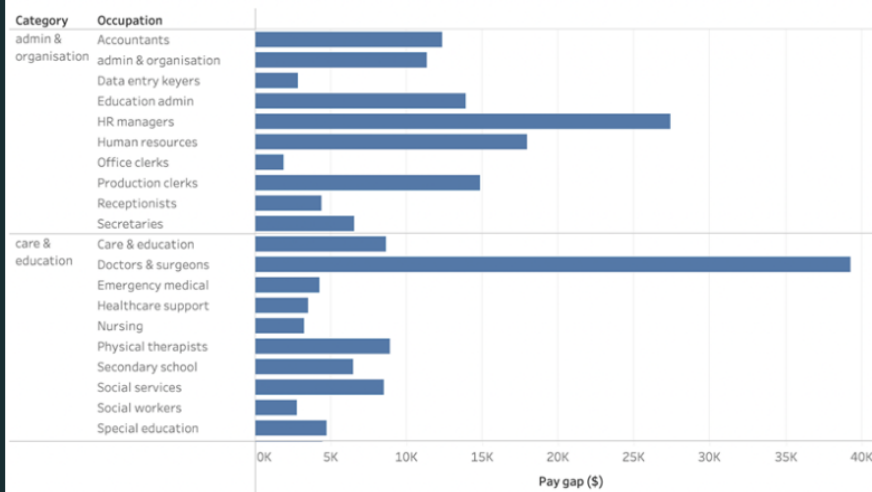
Note: Please select all correct answers. Incorrect choices will be penalised.

| Country             | Confirmed | Deaths | Recovered | Active | Population | Continent     |
|---------------------|-----------|--------|-----------|--------|------------|---------------|
| Afghanistan         | 39703     | 1473   | 33064     | 5166   | 38928341   | Asia          |
| Albania             | 15231     | 416    | 9406      | 5409   | 2877800    | Europe        |
| Algeria             | 52940     | 1795   | 37170     | 13975  | 43851043   | Africa        |
| Andorra             | 2696      | 55     | 1814      | 827    | 77265      | Europe        |
| Angola              | 6246      | 218    | 2716      | 3312   | 32866268   | Africa        |
| Antigua and Barbuda | 111       | 3      | 97        | 11     | 97928      | North America |
| Argentina           | 883882    | 23581  | 709464    | 150837 | 45195777   | South America |
| Armenia             | 55736     | 1016   | 45771     | 8949   | 2963234    | Europe        |
| Australia           | 27263     | 898    | 24987     | 1378   | 25499881   | Oceania       |
| Austria             | 54423     | 852    | 42829     | 10742  | 9006400    | Europe        |
| Azerbaijan          | 41752     | 608    | 39235     | 1909   | 10139175   | Europe        |
| Bahamas             | 5023      | 106    | 2815      | 2102   | 393248     | North America |
| Bahrain             | 75287     | 273    | 70808     | 4206   | 1701583    | Asia          |
| Bangladesh          | 377073    | 5500   | 291365    | 80208  | 164689383  | Asia          |
| Barbados            | 206       | 7      | 183       | 16     | 287371     | North America |
| Belarus             | 82471     | 885    | 76543     | 5043   | 9449321    | Europe        |
| Belgium             | 156931    | 10175  | 20202     | 126554 | 11589616   | Europe        |

- ☐ a. Use x-axis to represent "Active cases", y-axis to represent "Deaths", size (area) to represent "Confirmed cases"
- ☐ b. Use x-axis to represent "Confirmed cases", y-axis to represent "Active cases", size (area) to represent "Deaths"
- ☐ c. Use x-axis to represent "Confirmed cases", y-axis to represent "Deaths", size (area) to represent "Active cases"
- ☐ d. Use x-axis to represent "Active cases", y-axis to represent "Confirmed cases", size (area) to represent "Deaths"

## Gender Pay Gap US

pay gap = male yearly salary - female yearly salary



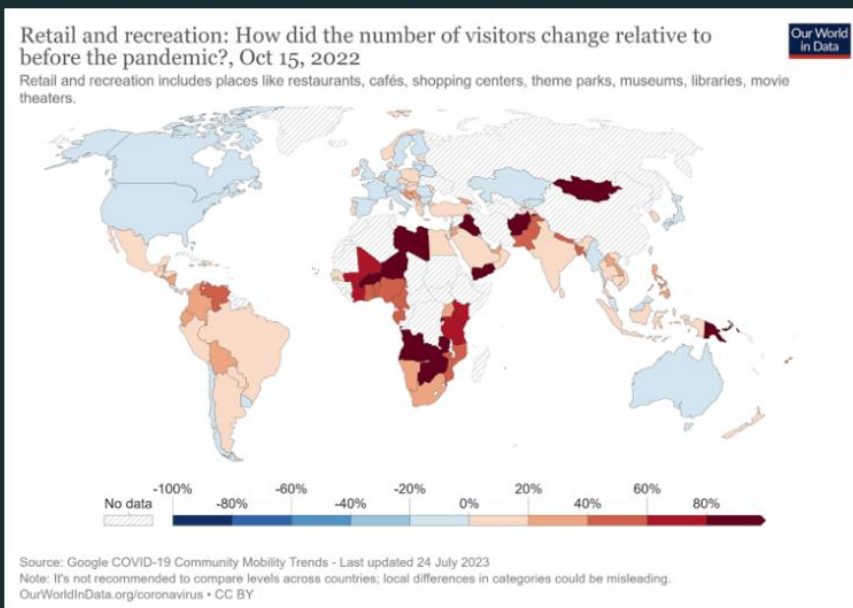
This visualisation shows a Gender Pay Gap dataset for the USA. Which of the following statements are correct? Select all correct answers.

Note: Please select all correct answers. Incorrect choices will be penalised.

- ☐ a. This chart shows two categorical attributes.
- ☐ b. One of the nominal attributes is shown using the position channel.
- ☐ c. This chart shows the average salary of different groups of professionals.
- ☐ d. A blue colour hue is used as a visual channel to show a quantitative attribute.

Consider the "change of the number of visitors" attribute in the following visualisation. Select all the correct descriptions of this attribute.

Note: Please select all correct answers. Incorrect choices will be penalised.



Resource: <https://ourworldindata.org/covid-mobility-trends>

- ☐ a. The attribute is derived from absolute values.
- ☐ b. It is a cyclic attribute.
- ☐ c. The ordering direction of the attribute is sequential.
- ☐ d. The ordering direction of the attribute is diverging.
- ☐ e. It is a categorical attribute.

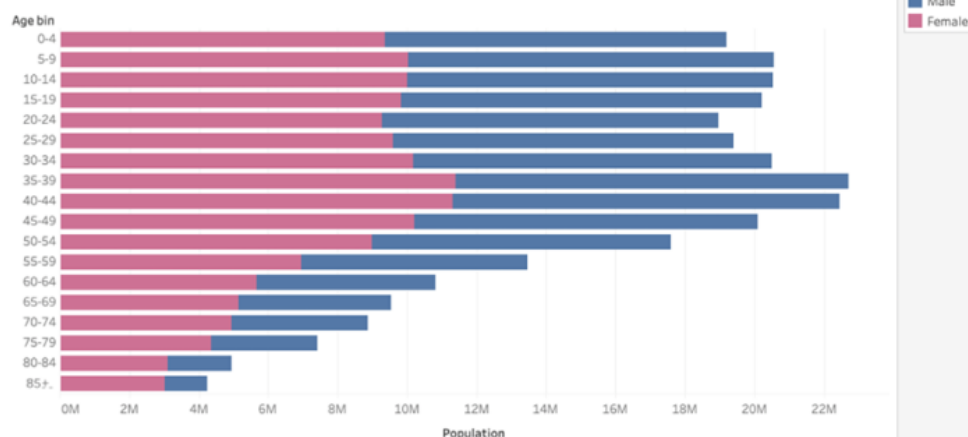
Select the main changes in the following colour scale.

(Information for those with difficulty distinguishing red and green colour: The gradient does not show any shade of red or green colour.)



- ☐ a. Colour saturation
- ☐ b. Colour hue
- ☐ c. Colour luminance

Stacked bar chart



Which of the following statements are incorrect? Select all incorrect answers.

*Note: Please select all correct answers. Incorrect choices will be penalised.*

- ☐ a. The age bin (for example, "0-4") is an ordered attribute that is shown with the position channel.
- ☐ b. The marks used are lines and there are approximately 20 million males in the age bin "45-49".
- ☐ c. This graph shows two attributes.
- ☐ d. Gender is a nominal attribute, which is visualised with the colour hue channel.

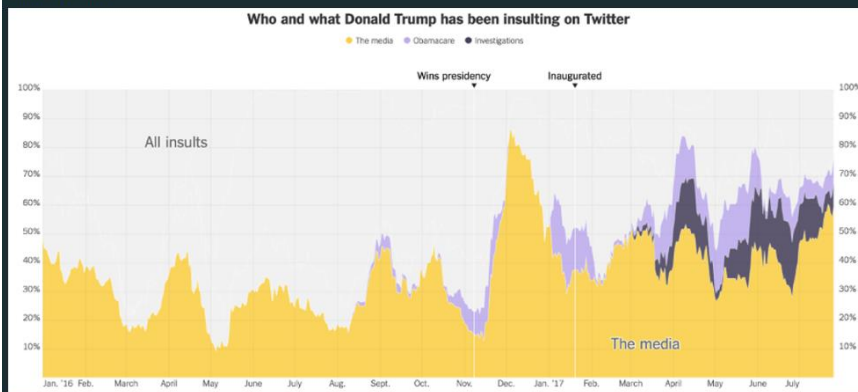
Let's think about visualising the "property type" attribute (that is, house, unit, apartment, etc.) in a real estate dataset. Select the effective visual channel(s) from below to encode this attribute.

*Note: Please select all correct answers. Incorrect choices will be penalised.*

- ☐ a. Length
- ☐ b. Colour saturation
- ☐ c. Shape
- ☐ d. Area
- ☐ e. Colour hue



This chart was created for a news story by the New York Times and published in July 2017. It shows tweets by Trump over time. You can see the news story and the chart here at the link below, but for answering the question there is no need to go to this web page. <https://www.nytimes.com/interactive/2017/07/26/upshot/president-trumps-newest-focus-discrediting-the-news-media-obamacare.html>

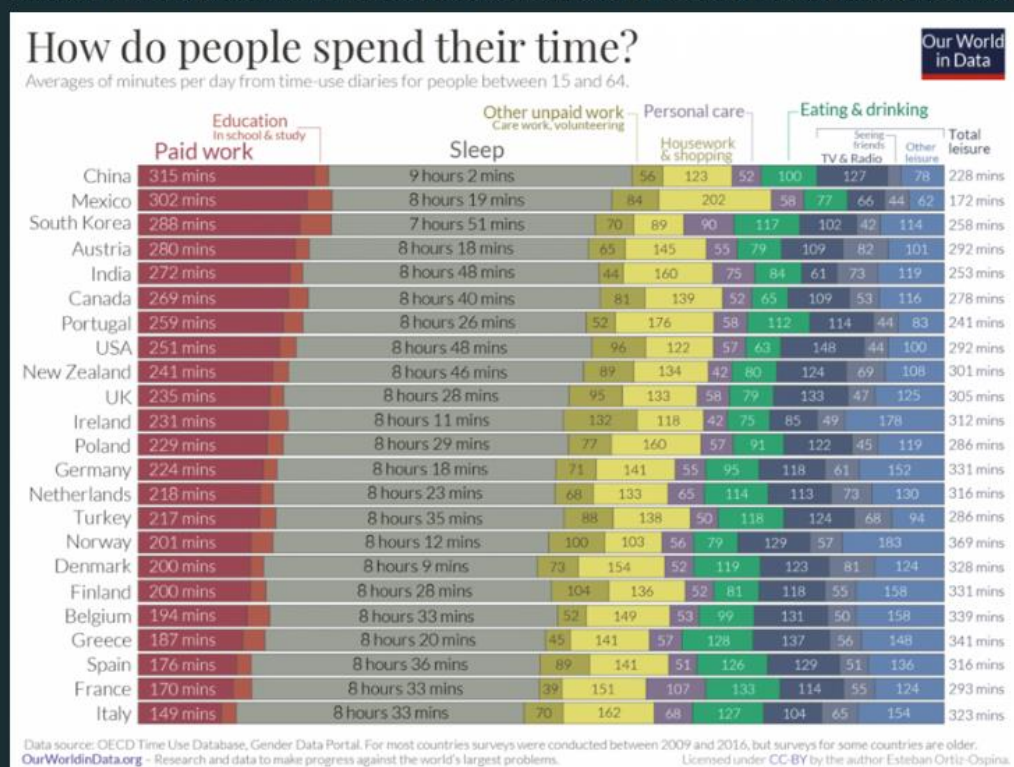


Which of the following statements are correct? Hint: carefully consider the terms used in the statements.

Note: Select all correct answers. Incorrect choices will be penalised.

- ☐ a. This chart is showing a table dataset. Assuming that each day is an item in this table, each item has at least three ordered attributes.
- ☐ b. Based on the data shown in this chart, after winning the elections in Nov 2016, Trump tweeted more about "Obamacare" than about the "media".
- ☐ c. This line chart shows normalised values.
- ☐ d. This line chart uses hue as an attribute to show different nominal types of tweets.

Consider the following visualisation. What is the visual channel used to represent the time that people spend on Sleep?



- ☐ a. Colour hue
- ☐ b. 2D Size
- ☐ c. 1D Size
- ☐ d. Line
- ☐ e. Area
- ☐ f. Stacked bar