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Writing Effective Alt-Text in Statistics and Data Science

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What is alt-text?

Alternative (Alt) text is a written description of an image.

Effective alt text is...

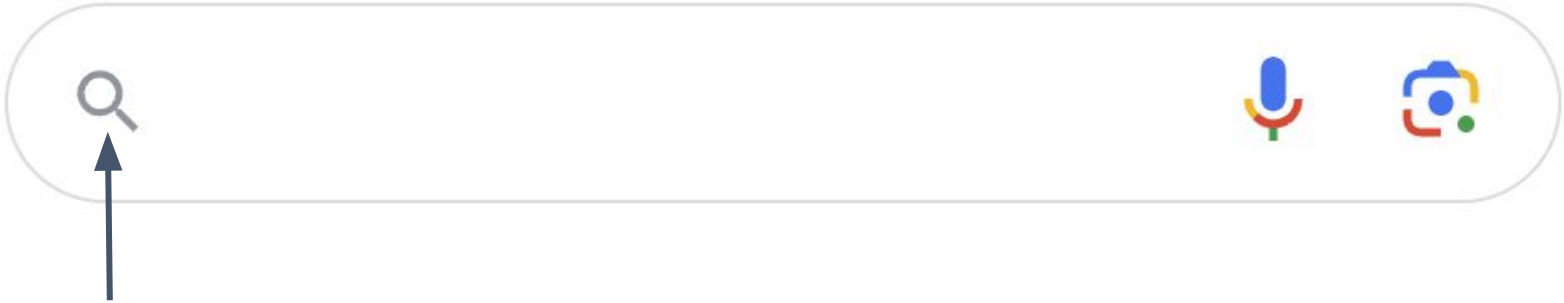
- accurate
- succinct
- appropriate for the context
- formatted logically

Alt-text example

"A magnifying glass"

"~~An image of~~ a magnifying glass"

Alt-text example with context



"A magnifying glass"?

"Search"

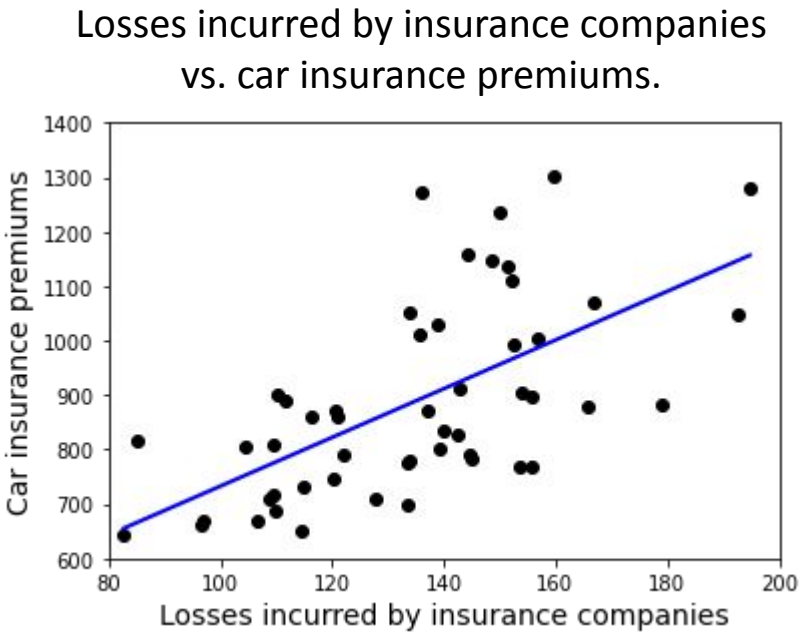
Components of a chart/graph

Title

Type of chart

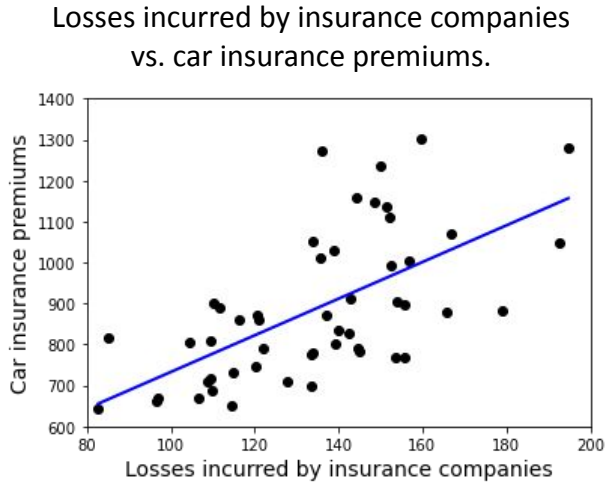
Legend

Axes
- titles
- ranges
- increments



The data
- exact data points
- # of points
- outliers
- trends
- lines
- the "takeaway"
- a link to the dataset
- etc...

An image vs. alt-text



A sighted person can look at the components of a graph in any order.

"The scatter plot of 51 points graphs losses incurred by insurance companies (x) vs car insurance premiums (y). The scatter plot appears to have a linear form."

A screen reader can only navigate alt-text by paragraphs, sentences, lines, words, or characters.

The screen reader can not navigate the alt-text by the different components of the graph.

The skeleton alt-text

Alt text for a graph should generally start with:

"A <GRAPH TYPE> of <TITLE>."

Note: the <TITLE> can be worded differently than it appears on the graph.

The rest of the text depends on the context of the image. Answering the following questions may help you decide which components of the graph need to be described in the alt-text.

- What is included in the text surrounding the image?
- Is the image part of an assessment?
- Why is this image included?

Good practices

- Review alt text in the context that it will be used in.
- Use proper grammar.
- Use the same tone and conventions used in the surrounding text.
- Use a standard format for similar images.
  - ex: "A scatterplot of <TITLE>. The x-axis displays <x-TITLE> and ranges from a to b. The y-axis displays <y-TITLE> and ranges from c to d...."

Breakout activity

Instructions: Each group has three images: a "basic" plot, a more complicated plot, and a diagram. In your breakout rooms, work together to write alt-text for your images.

- How would the alt-text change if the image was used in lecture slides? Homework questions? Exams?
- Could the image be replaced by a table or list?
- How could the images be improved for better accessibility?

Recommendations

- Include alt-text for all images, in context
- Consistent alt-text (structure, style, language, ect.) improves the student experience
- Consider including a table of numerical summaries after a graph
  - Screen readers can navigate tables
- Focus alt-text on the information the image contains
- Diagrams and complex images can be challenging to write effective alt-text
  - Write alt text for smaller components in the diagram, then combine the alt text chunks in a meaningful and logical order.
- Don't write for the screen reader.
  - Different screen reader and browser combinations may act differently.

Tools & Resources

Generating alt text

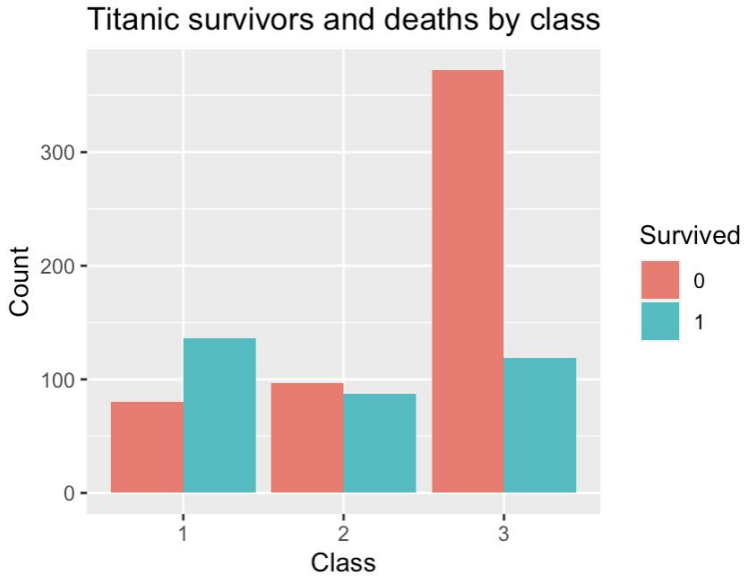
- BrailleR package
- Bing Copilot
- Ahref's Image Alt Text Generator
- AI Alt Text Generator

Adding alt text

- Microsoft Word
- R Markdown
- Quarto
- Google Docs

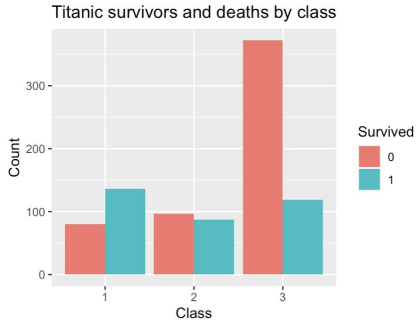
BrailleR example

```
library(BrailleR)
counts <- as.data.frame(table(Titanic$Survived, Titanic$Pclass))
ggplot(counts, aes(fill=Var1, y=Freq, x=Var2)) +
  geom_bar(position="dodge", stat="identity")+
  ggtitle("Titanic survivors and deaths by class")+
  xlab("Class")+
  ylab("Count")+
  labs(fill = "Survived")
```



This chart has title 'Titanic survivors and deaths by class'.
It has x-axis 'Class' with labels 1, 2 and 3.
It has y-axis 'Count' with labels 0, 100, 200 and 300.
There is a legend indicating fill is used to show Survived, with 2 levels:
0 shown as strong reddish orange fill and
1 shown as brilliant bluish green fill.
The chart is a bar chart with 6 vertical bars.
Bar 1 is centered at 0.78, and length is from 0 to 80 with fill colour strong reddish orange which maps to Survived = 0.
Bar 2 is centered at 1.23, and length is from 0 to 136 with fill colour brilliant bluish green which maps to Survived = 1.
Bar 3 is centered at 1.77, and length is from 0 to 97 with fill colour strong reddish orange which maps to Survived = 0.
Bar 4 is centered at 2.22, and length is from 0 to 87 with fill colour brilliant bluish green which maps to Survived = 1.
Bar 5 is centered at 2.78, and length is from 0 to 372 with fill colour strong reddish orange which maps to Survived = 0.
Bar 6 is centered at 3.22, and length is from 0 to 119 with fill colour brilliant bluish green which maps to Survived = 1.

AI tools



Copilot

The image you've uploaded is a bar chart titled **"Titanic survivors and deaths by class."** It compares the number of survivors and non-survivors across three classes of passengers on the Titanic. Here are the key details:

- **First Class**: About 80 non-survivors and over 130 survivors.
- **Second Class**: Roughly 100 non-survivors and just under 90 survivors.
- **Third Class**: Nearly 370 non-survivors and around 120 survivors.

The y-axis represents the count, ranging from 0 to 300, and the x-axis denotes the class (1, 2, and 3). The light blue bars indicate non-survivors, and the red bars represent survivors. This chart provides insights into the survival rates and how they may have been influenced by socio-economic status. There are no mathematical problems present in the image.

Ahref's Image Alt Text Generator

380 characters · 63 words · Formal · English

1. Bar chart displaying survivors and deaths by class: 1st class had most survivors, 3rd class had highest number of deaths.
2. Visualization of survivors and deaths by class: 1st class had highest survival rate, 3rd class had most fatalities.
3. Graph illustrating survivors and deaths by class: 1st class had the most survivors, while 3rd class had the highest number of deaths.

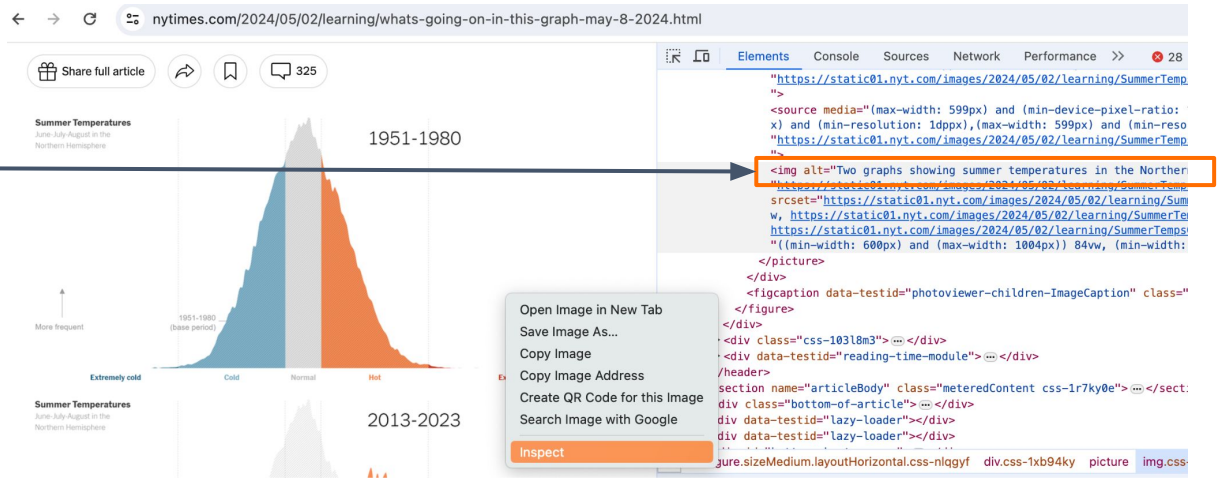
AI Alt Text Generator

alt= Bar chart depicting Titanic survivors and deaths by class. Class 3 has the highest number of deaths. Class 1 shows more survivors than deaths. The chart has a count axis and separate bars for survival status.

Alt text from web images with alt text

Chrome:

- Right-click image
- Inspect
- Look for <img alt=




```
alt="Two graphs showing
summer temperatures in
the Northern Hemisphere
for the periods
1951-1980 and
2013-2023."
```

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Questions?

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