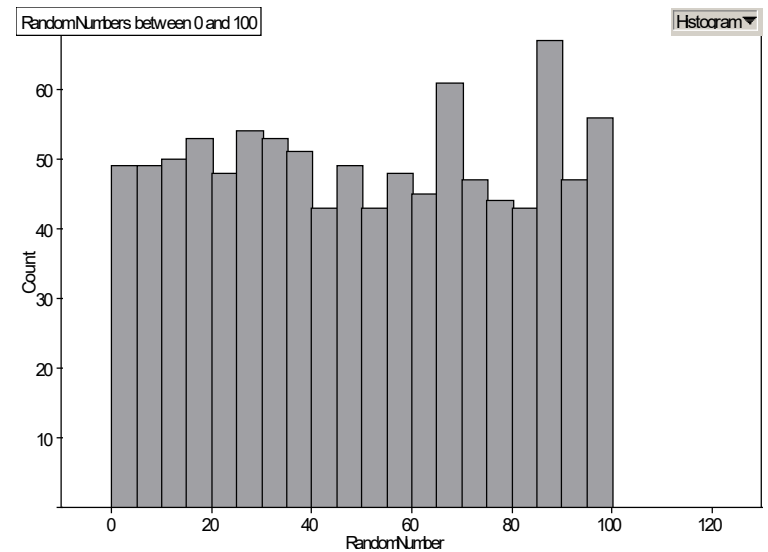
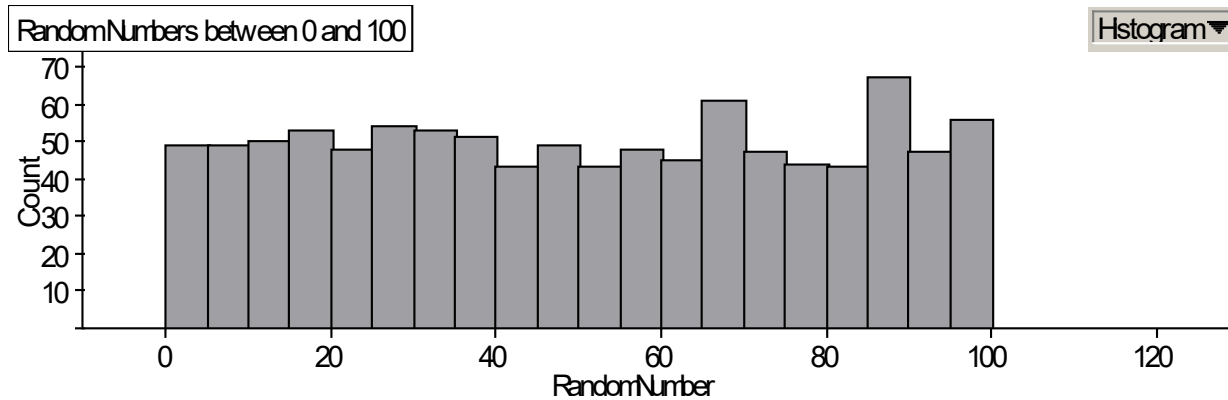


Misleading Graphs

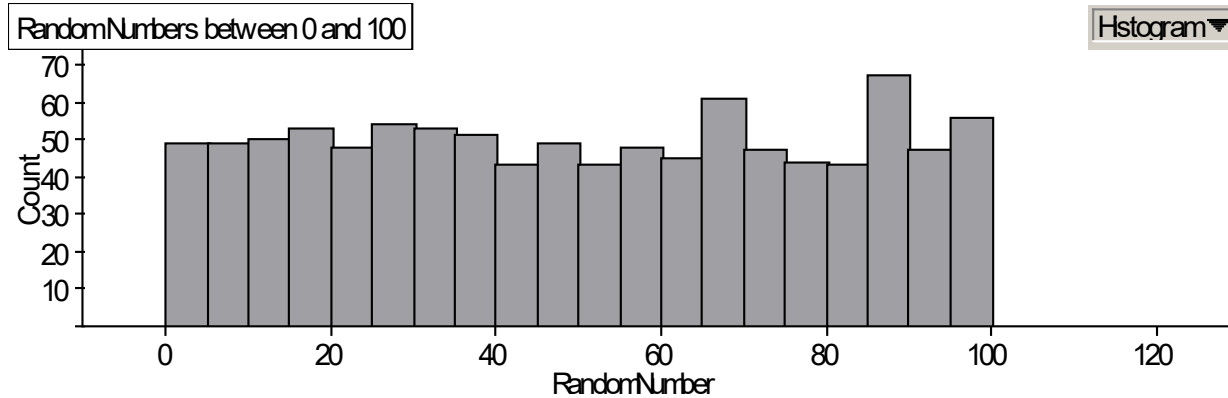
Misleading Graphs

- What makes a graph meaningful?
- What makes a graph misleading?

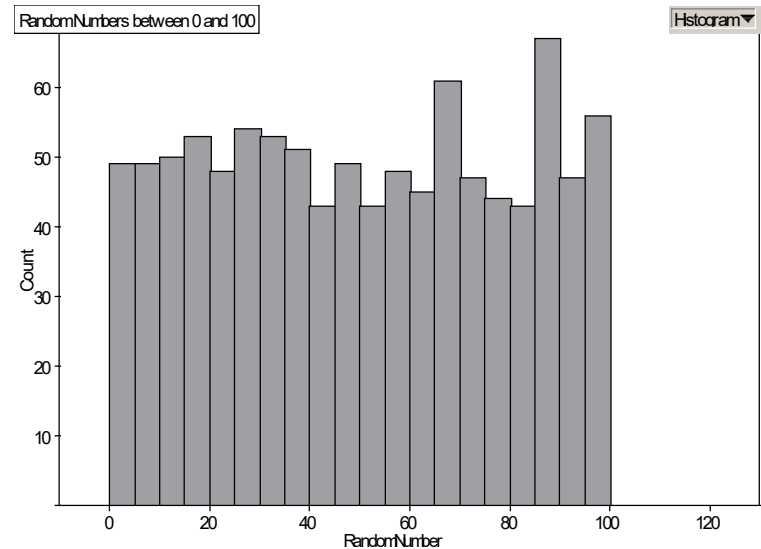
Examine the graphs below.



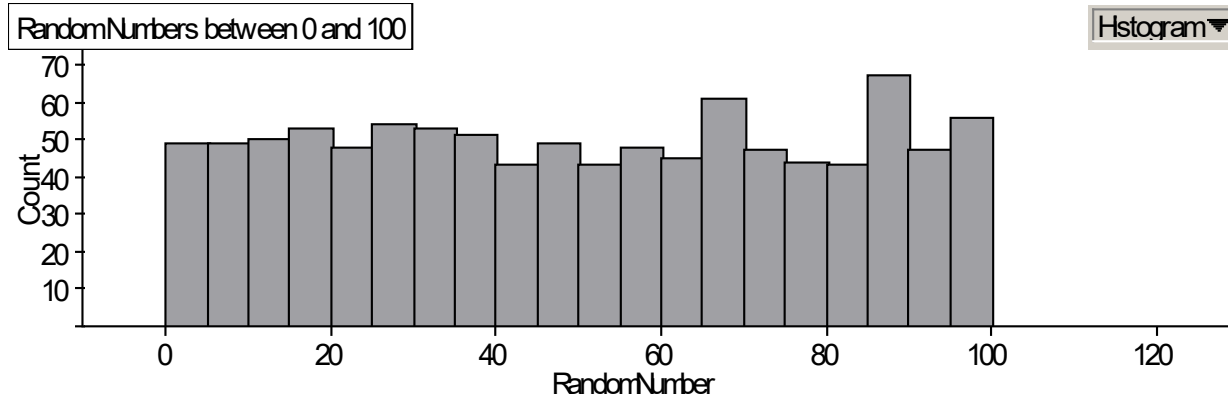
Examine the graphs below.



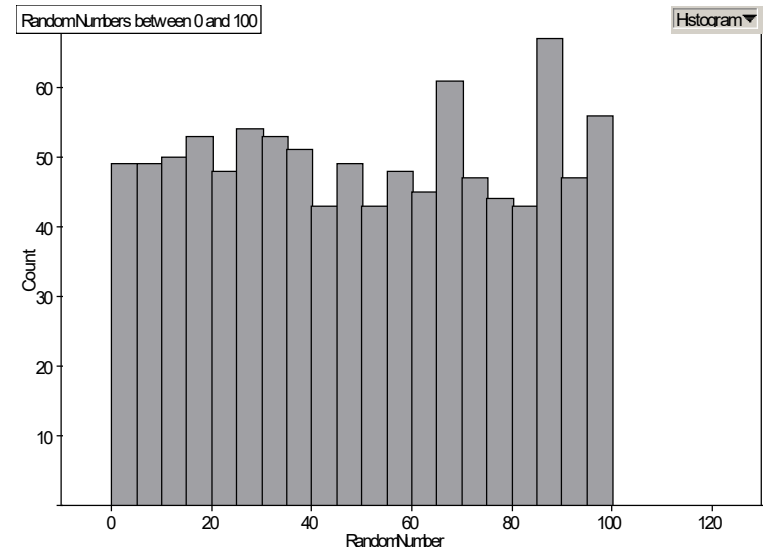
- Are they similar?
Are they different?



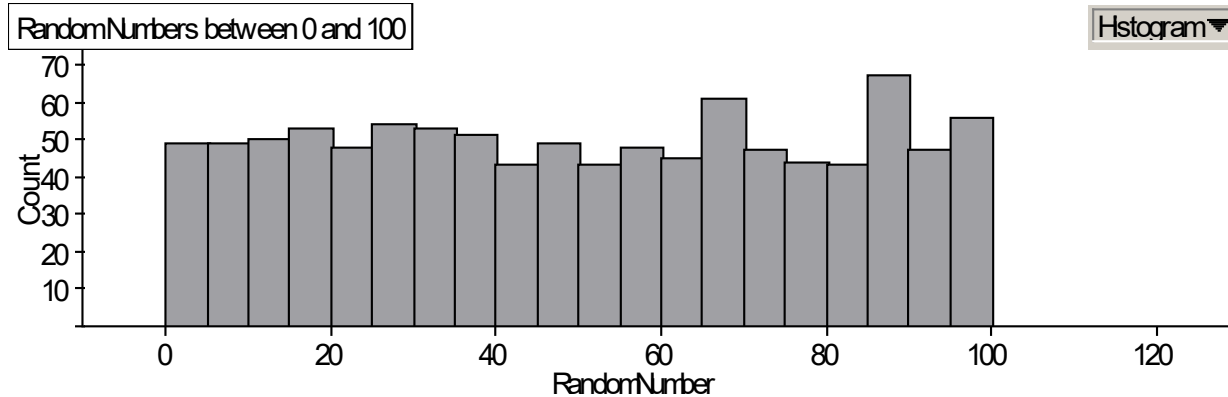
Examine the graphs below.



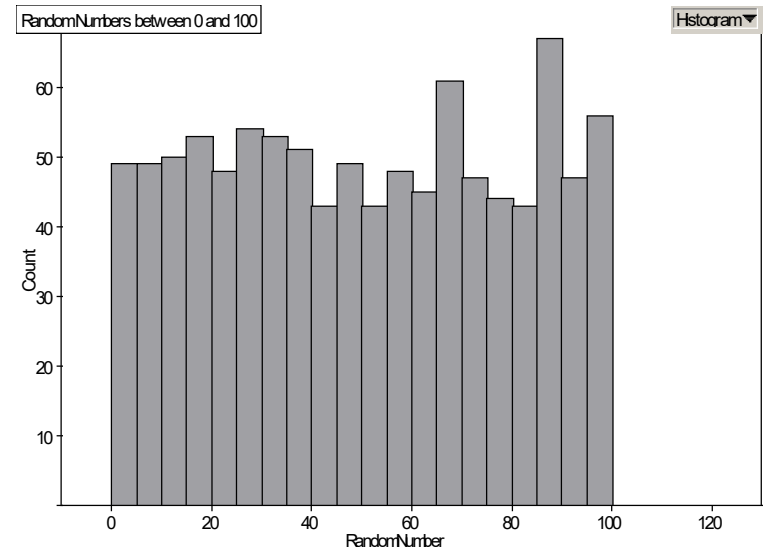
- These are the same graph!



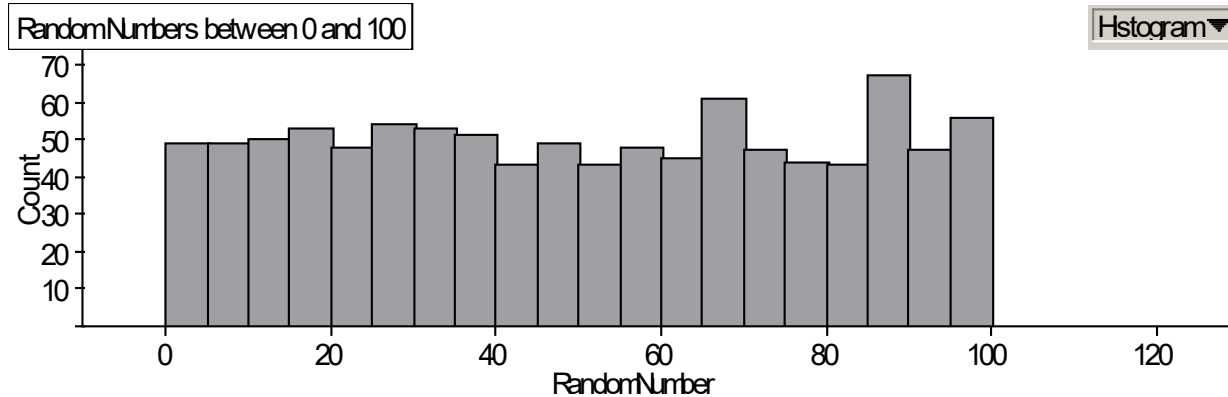
Examine the graphs below.



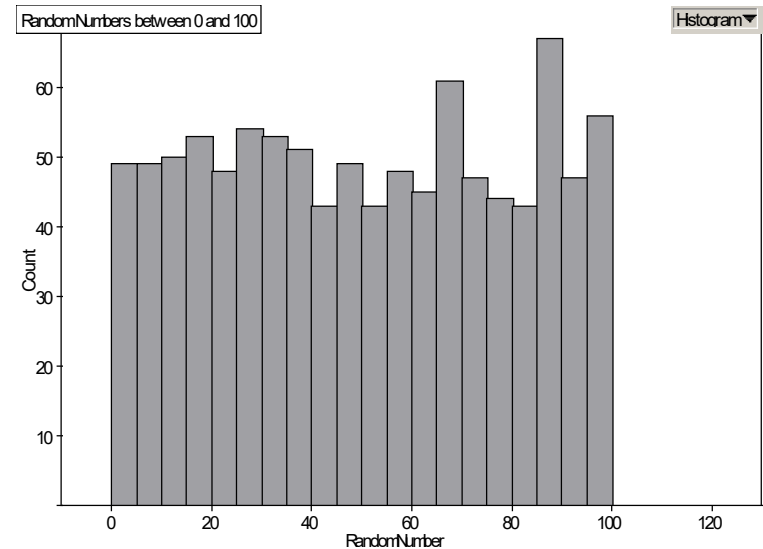
- These are the same graph!
 - The graph above has been stretched horizontally.



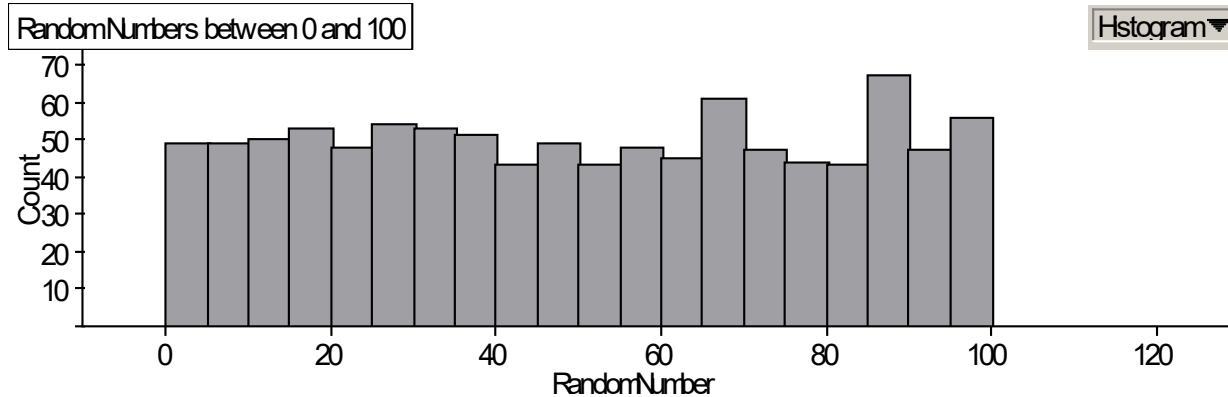
Examine the graphs below.



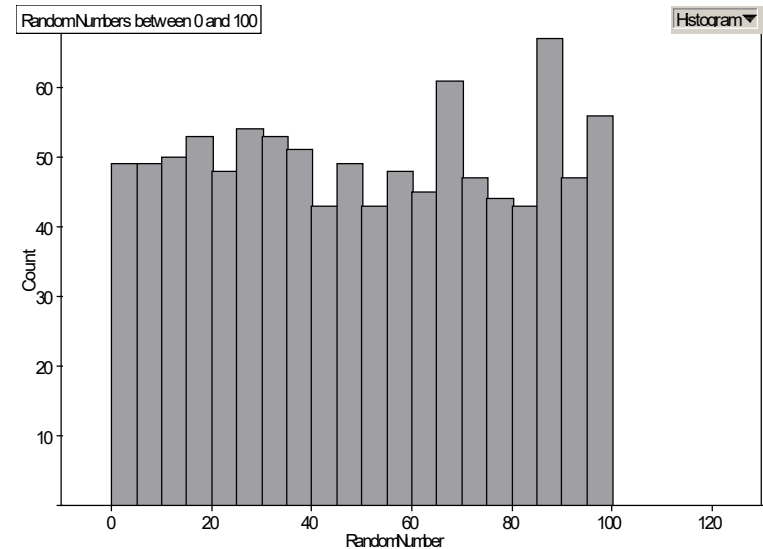
- These are the same graph!
 - The graph to the right has been compressed horizontally.



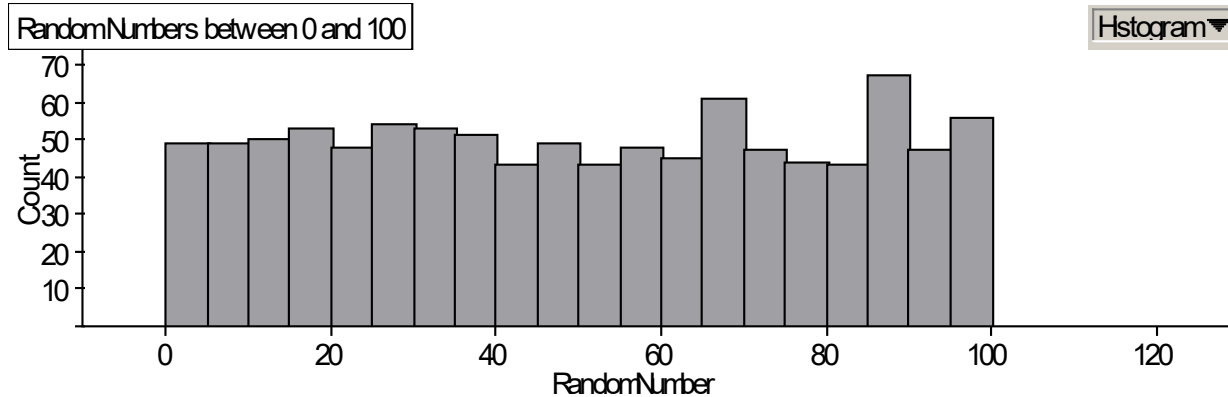
Examine the graphs below.



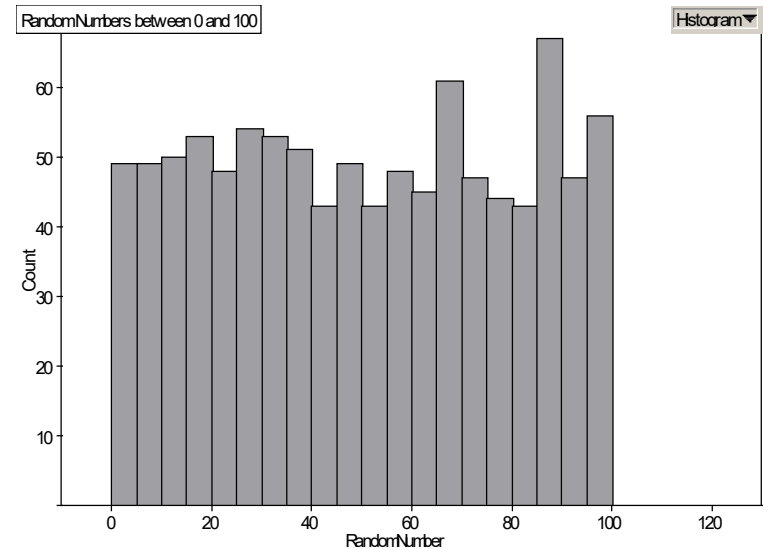
- These are the same graph!
 - The graph above has been compressed vertically.



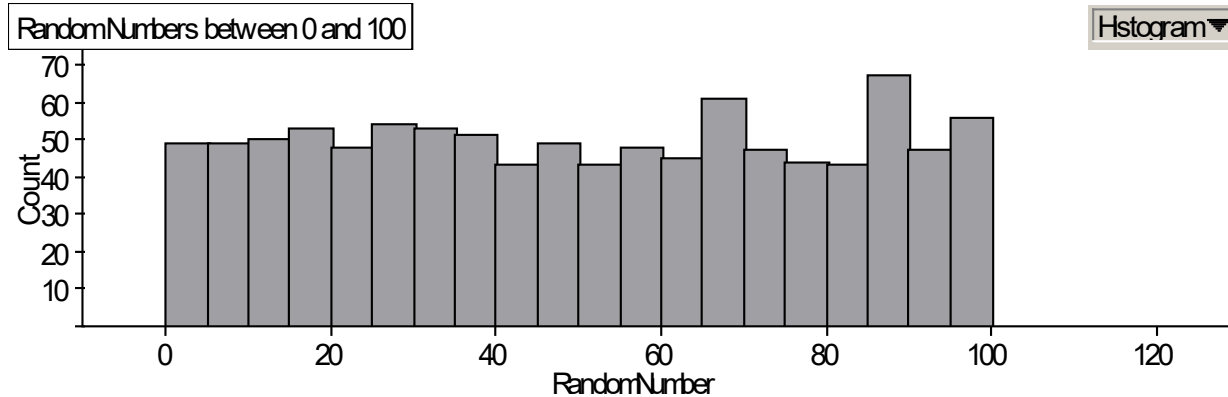
Examine the graphs below.



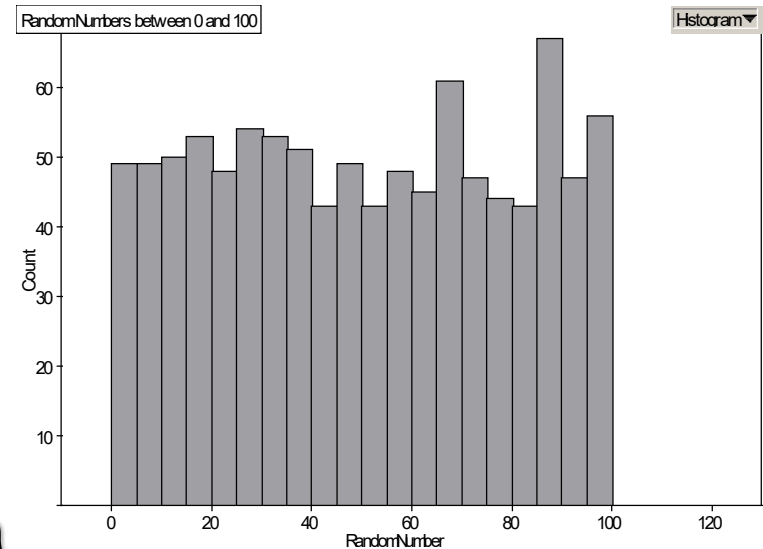
- These are the same graph!
 - The graph to the right has been stretched vertically.



Examine the graphs below.



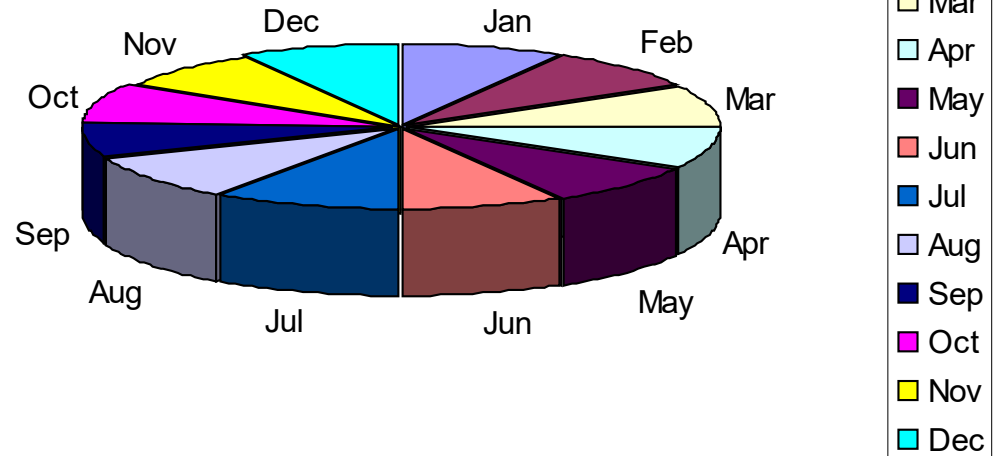
- These are the same graph!
 - Stretching or compressing a graph affects how the information is perceived.



Pie Chart

- Is the graph below *comprehensible* or is it *misleading*?

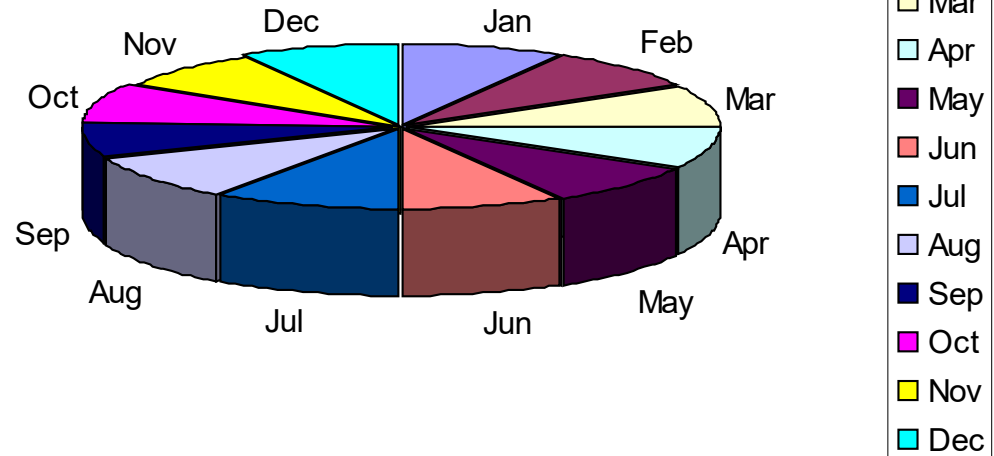
Solar Eclipses by Month (1901-2000)
Relative Frequency



Pie Chart

- Is the graph below *comprehensible* or is it *misleading*?

Solar Eclipses by Month (1901-2000)
Relative Frequency

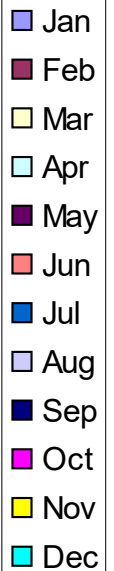
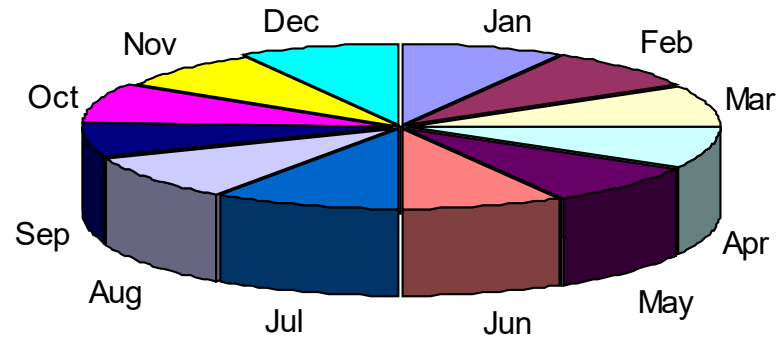


- All the important information is missing from this graph!

Pie Chart

- What is missing from this pie chart?

Solar Eclipses by Month (1901-2000)
Relative Frequency

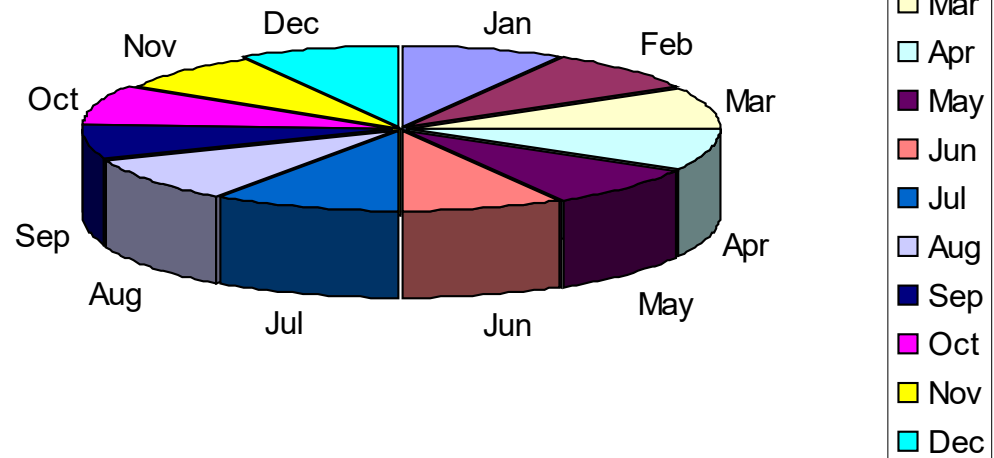


Pie Chart

- What is missing from this pie chart?

Solar Eclipses by Month (1901-2000)
Relative Frequency

- A pie chart must display the percentage (i.e. relative frequency) for each sector of the pie.

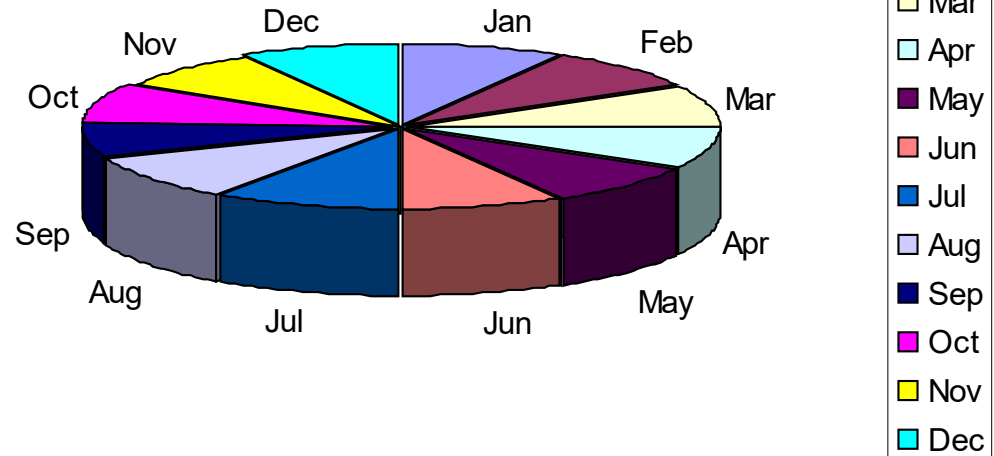


Pie Chart

- What is missing from this pie chart?

Solar Eclipses by Month (1901-2000)
Relative Frequency

- There are no percentages displayed in this pie chart.

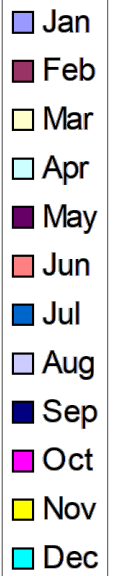
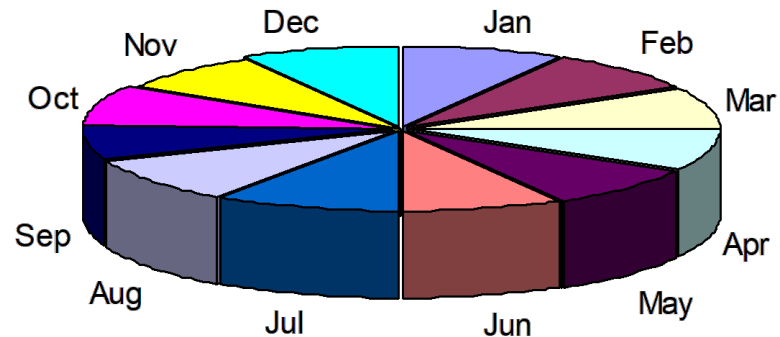


Pie Chart

- What else should be changed in order to make this pie chart *meaningful and comprehensible*?

Solar Eclipses by Month (1901-2000)
Relative Frequency

- To be meaningful, the sectors of a pie chart must be displayed so that their proportions can be compared.

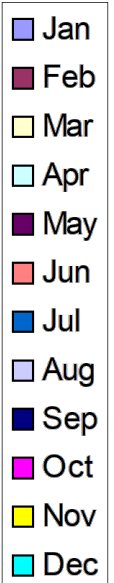
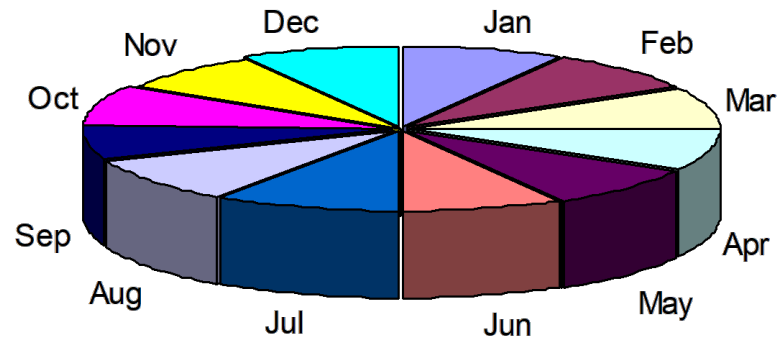


Pie Chart

- What else should be changed in order to make this pie chart *meaningful and comprehensible*?

Solar Eclipses by Month (1901-2000)
Relative Frequency

- A 3-dimensional pie does not allow one to view the proportions of the sectors of the pie.

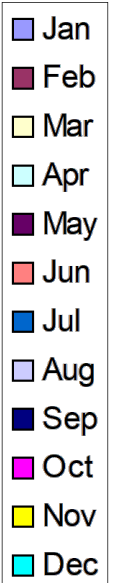
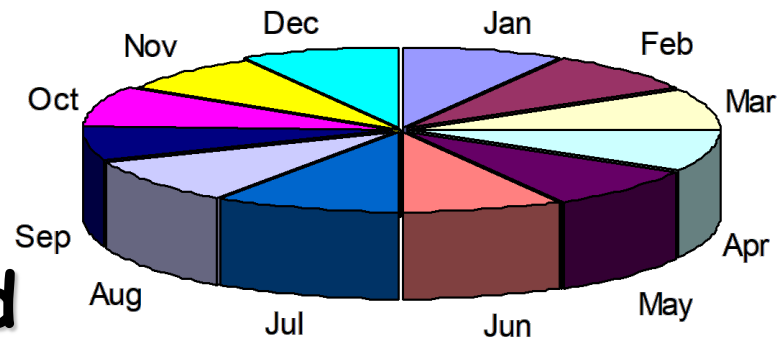


Pie Chart

- What else should be changed in order to make this pie chart *meaningful and comprehensible*?

Solar Eclipses by Month (1901-2000)
Relative Frequency

- A pie chart must be created as a circle so that the face of the pie can be viewed and the proportions of the sectors can be compared.

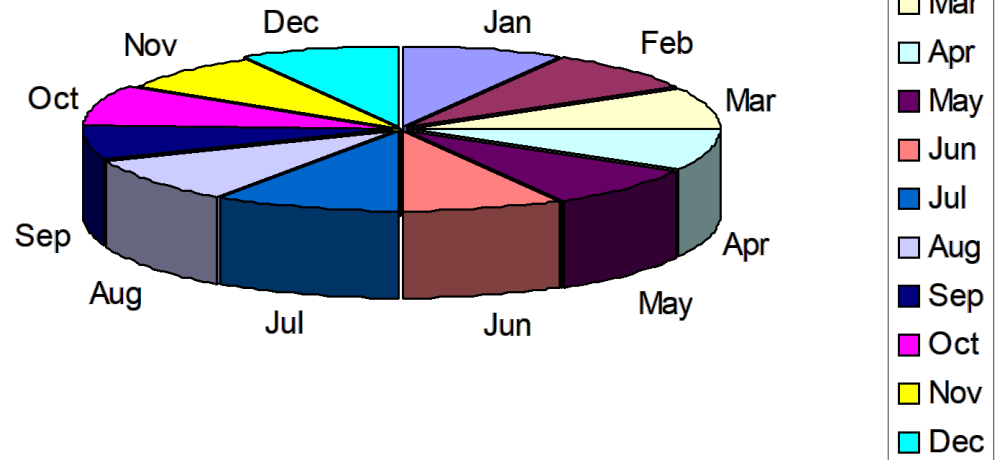


Pie Chart

- What else should be changed in order to make this pie chart *meaningful and comprehensible*?

Solar Eclipses by Month (1901-2000)
Relative Frequency

- The title is meaningless!

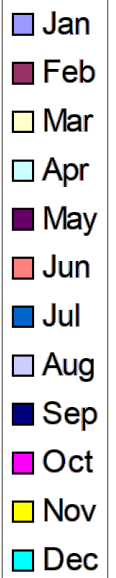
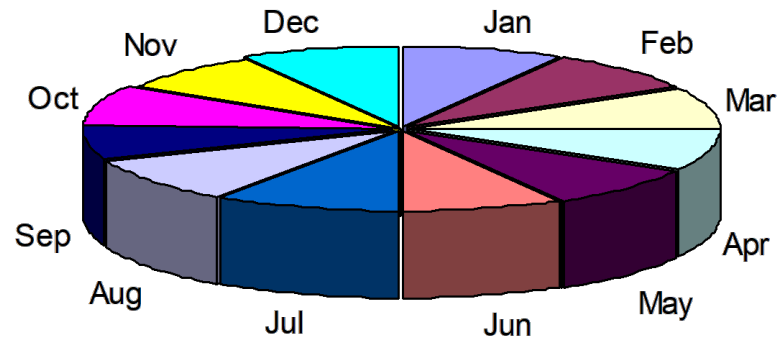


Pie Chart

- What else should be changed in order to make this pie chart *meaningful and comprehensible*?

Solar Eclipses by Month (1901-2000)
Relative Frequency

- The title itself demonstrates that this pie chart is meaningless as relative frequency has not been included.

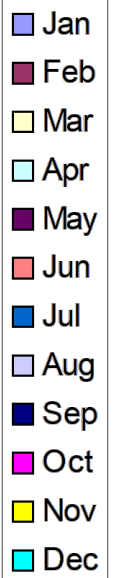
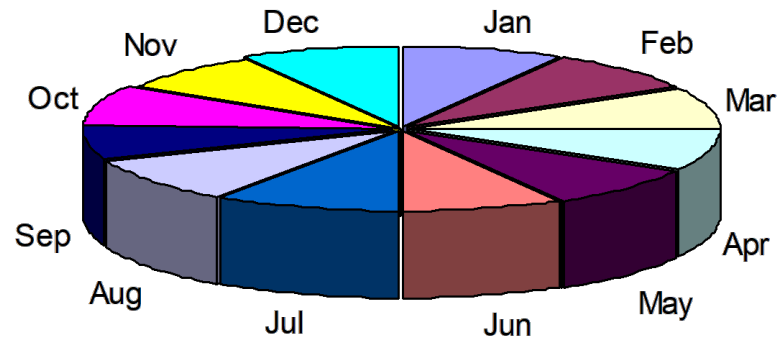


Pie Chart

- What else should be changed in order to make this pie chart *meaningful and comprehensible*?

Solar Eclipses by Month (1901-2000)
Relative Frequency

- Since the legend included with this “graph” does not share any information, it serves no purpose.



Discuss/examine the graph below.

- What else should be changed in order to make this “bar graph” *meaningful and comprehensible*?



Discuss/examine the graph below.

- What else should be changed in order to make this “bar graph” *meaningful and comprehensible*?
- There is no title.



Discuss/examine the graph below.

- What else should be changed in order to make this “bar graph” *meaningful and comprehensible*?
- There are no axes.



Discuss/examine the graph below.

- What else should be changed in order to make this “bar graph” *meaningful and comprehensible*?
- There is no horizontal axis.



Discuss/examine the graph below.

- What else should be changed in order to make this “bar graph” *meaningful and comprehensible*?
- There is no vertical axis.



Discuss/examine the graph below.

- What else should be changed in order to make this “bar graph” *meaningful and comprehensible*?
- The bars are **NOT** in proportion!



Discuss/examine the graph below.

- What else should be changed in order to make this “bar graph” *meaningful and comprehensible?*



- Examine the first bar for which the relative frequency is 22%

...

Discuss/examine the graph below.

- What else should be changed in order to make this “bar graph” *meaningful and comprehensible?*



- Examine the first bar for which the relative frequency is 22% and compare this to the relative frequency for the last bar, 41%.

Discuss/examine the graph below.

- What else should be changed in order to make this “bar graph” *meaningful and comprehensible*?



- Doubling the length for the first bar should be slightly greater (3%) than the length for the last bar.

Discuss/examine the graph below.

- What else should be changed in order to make this “bar graph” *meaningful and comprehensible*?
- The bars are NOT in proportion to one another.

