Wickham's: A layered grammar of graphics

- A plot consists of several components:
    - Data and aesthetic mappings
    - Geometric objects
    - Scales
    - Facet specification
    - Statistical transformations
    - Coordinate system

Wickham, H. (2010). A layered grammar of graphics. *Journal of Computational and Graphical Statistics*, *19*(1), 3-28.

Leland, W. (1999). *The grammar of graphics*. Springer.

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```
p9.ggplot(my_dataframe,
          p9.aes(…))
```

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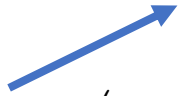
```



```
p9.aes(
  x= …, y = …,
  fill = …, shape = …,
  color = …, size = …)
```

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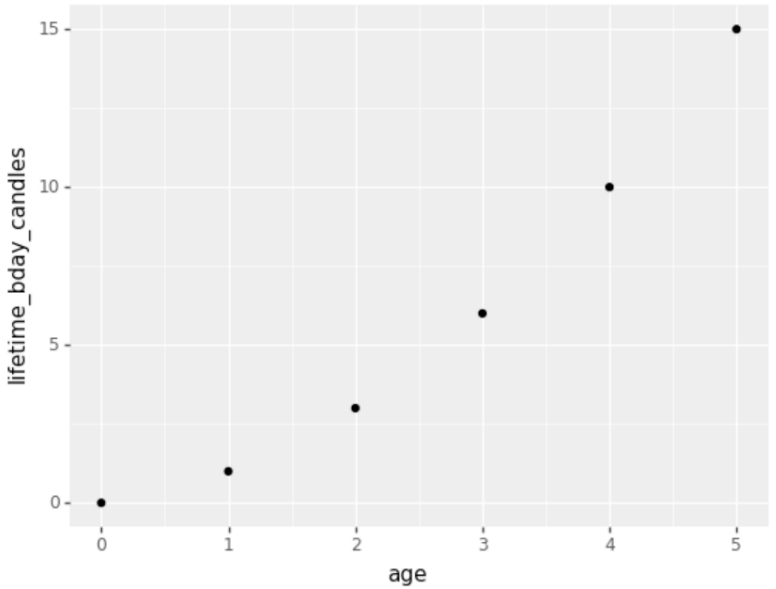
```
+ p9.geom_point()
```



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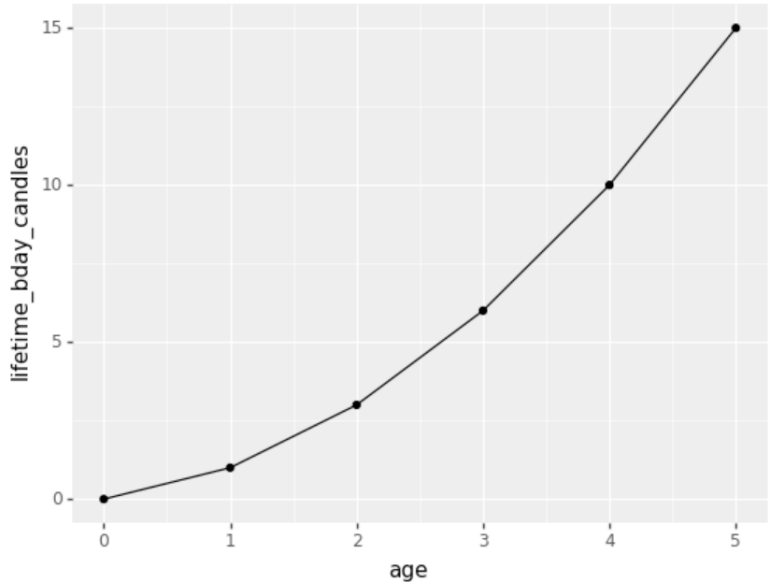
```
+ p9.geom_line()
```



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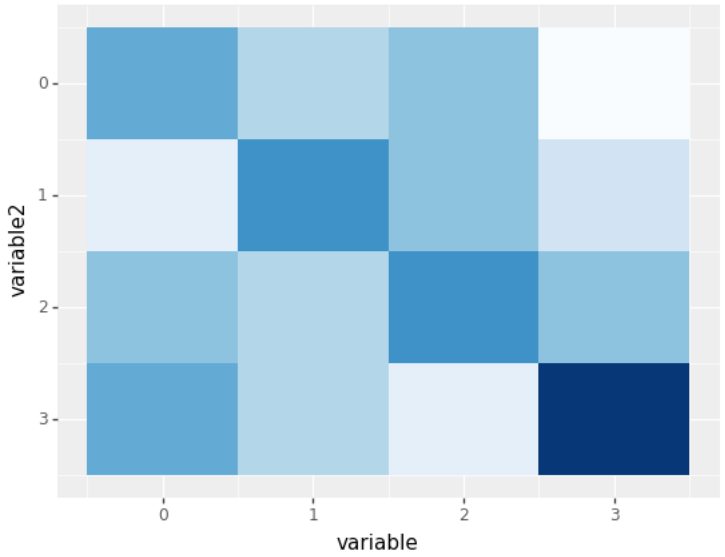
```
+ p9.geom_tile()
```



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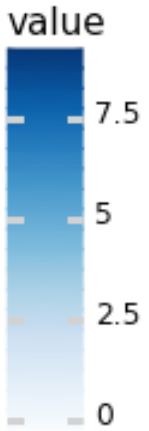


```
+ p9.scale_fill_continuous("Blues")
```

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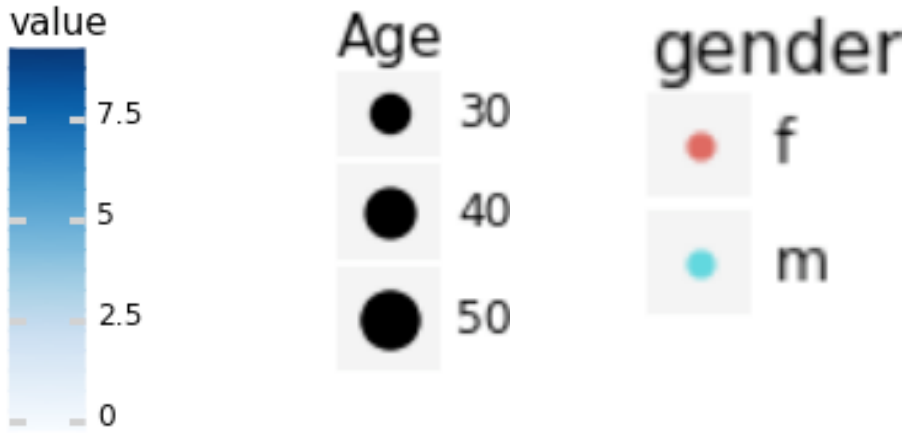

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To flip the y-axis:

```
+ p9.scales.scale_y_reverse()
```

To log scale the y-axis:

```
+ p9.scale_y_continuous(
    trans='log10')
```

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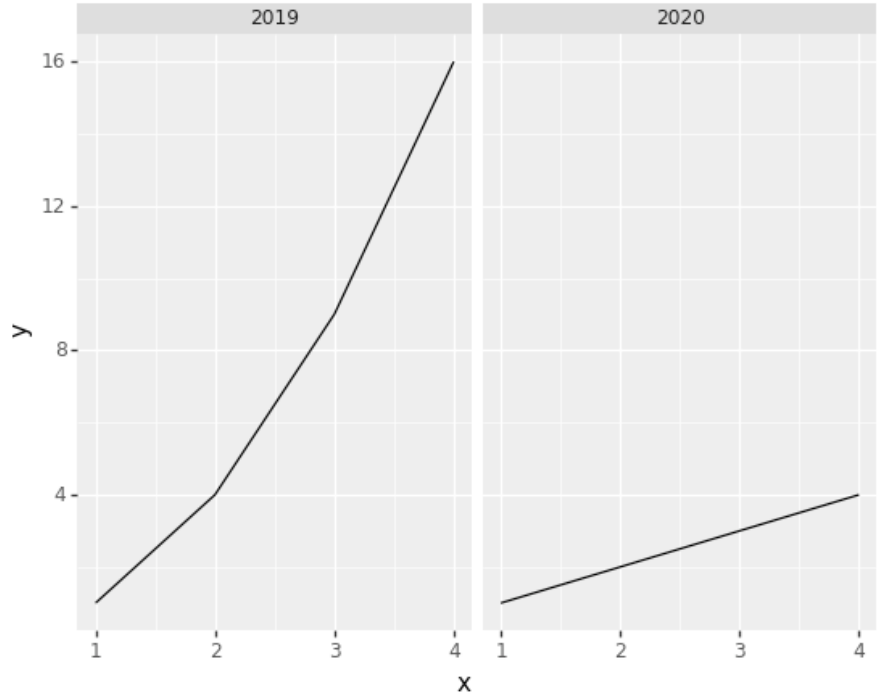
```
p9.ggplot(data, p9.aes(x='x', y='y')) + p9.geom_line() + p9.facet_wrap('year')
```



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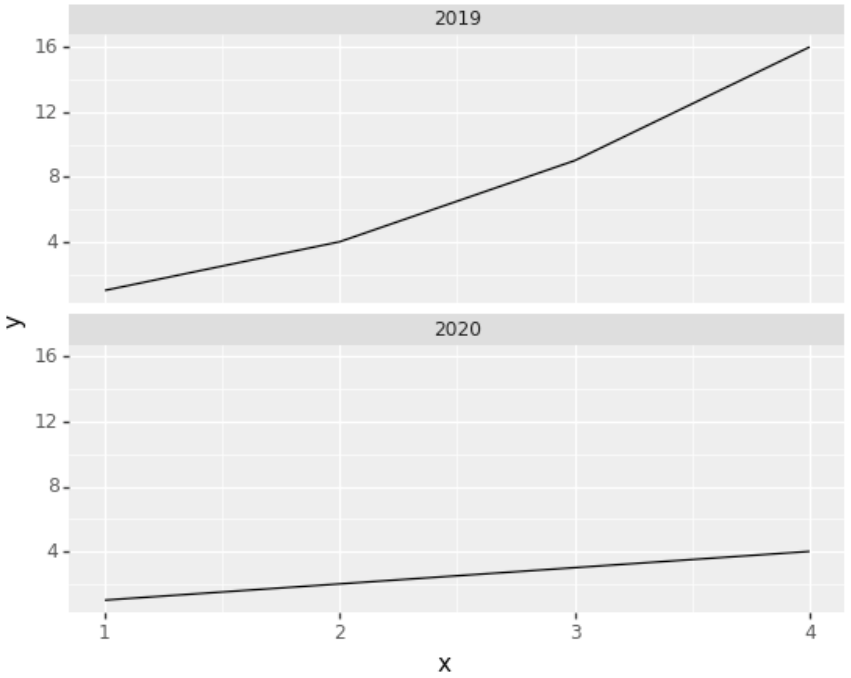
```
p9.ggplot(data, p9.aes(x='x', y='y')) + p9.geom_line() + p9.facet_wrap('year', nrow=2)
```



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To split by two columns of our data frame (and build a two dimensional group of subplots) use a `p9.facet_grid` instead:

```
p9.facet_grid("year ~ gender")
```

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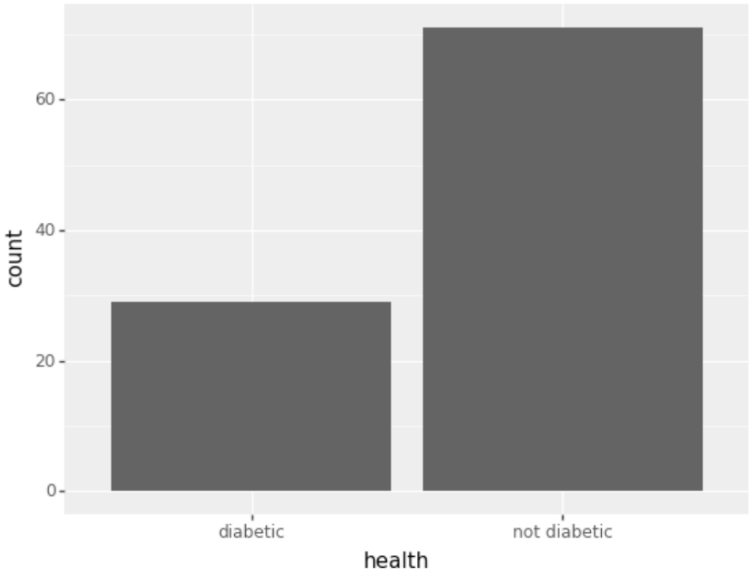
```
+ p9.geom_bar(stat='bin')
```



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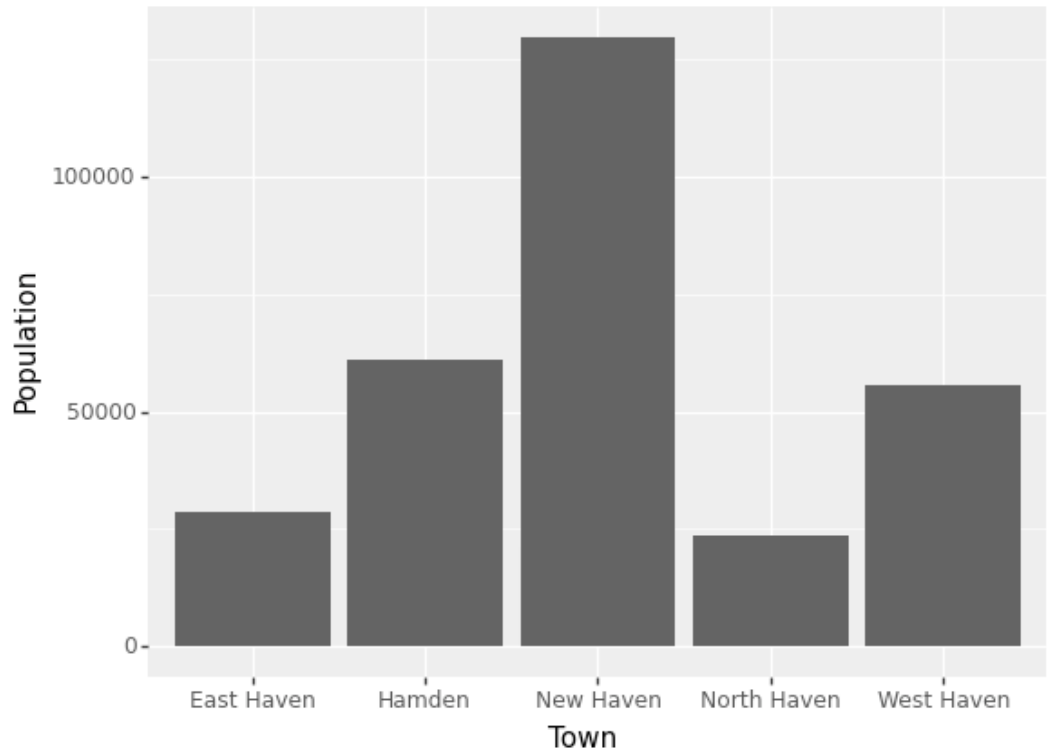
```
population = pd.DataFrame([
    ['New Haven', 129585],
    ['Hamden', 60960],
    ['West Haven', 55477],
    ['East Haven', 28699],
    ['North Haven', 23691]],
    columns=['Town', 'Population']
)
```

```
p9.ggplot(population, p9.aes(x='Town', y='Population')) + p9.geom_bar(stat='identity')
```



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Exchange the xs and ys:

```
+ p9.coord_flip()
```

Fixed aspect ratio:

```
+ p9.coord_fixed(ratio=1)
```

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