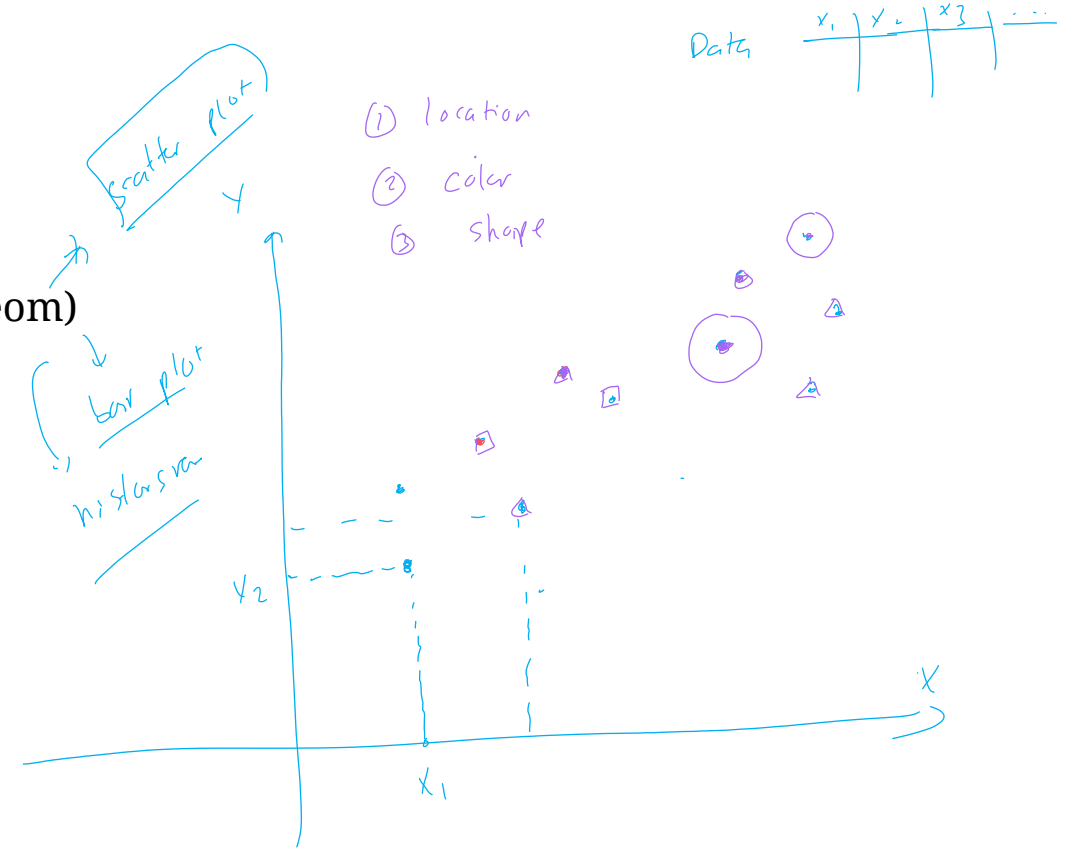
# Visualization - Aesthetic Mapping - Titanic

# A visualization:

- is a geometry object (a geom)
- whose aesthetics
- represents variables
- from a data set



# Aesthetics mean

- “something you can see”.

Examples include:

- position (i.e., on the x and y axes)
- color (“outside” color)
- fill (“inside” color)
- shape (of points)
- size

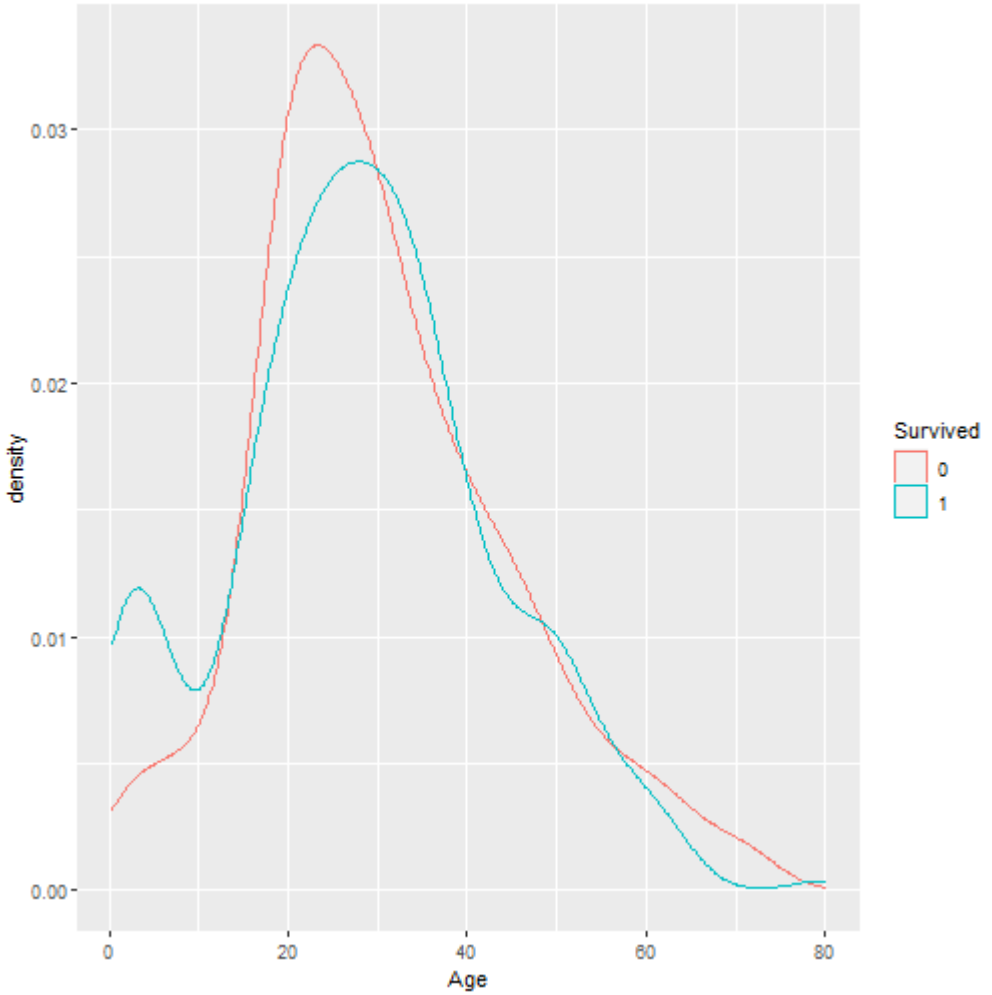
# Aesthetics Mapping

- map
- variables
- to aesthetics

# Examples

```
library(tidyverse)
library(ggplot2)
df <- read_csv('https://bryantstats.github.io/math421/data/titanic.cs
df <- df %>%
  mutate(Survived = as.character(Survived),
         Pclass = as.character(Pclass))
```

```
df %>% ggplot()+
  geom_density(mapping = aes(x = Age, color=Survived))
```



# Aesthetic of a geom

- A geom has its list of own aesthetics
- Use `?geom_point()` to check for the list of `geom_point`
- Some aesthetics are required, some are not

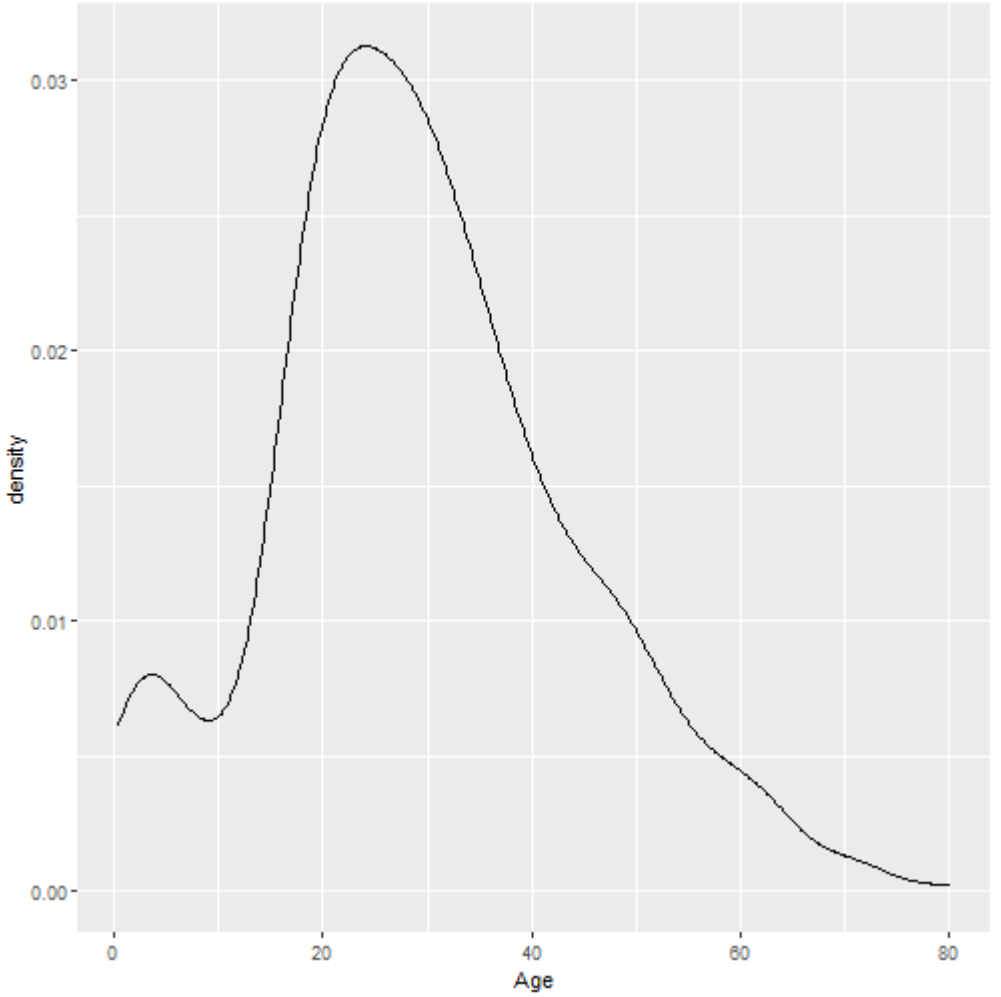
# Common Visualization Practices

# One Continuous Variable

- Density: `geom_density`
- Histogram: `geom_histogram`
- Boxplot: `geom_boxplot`

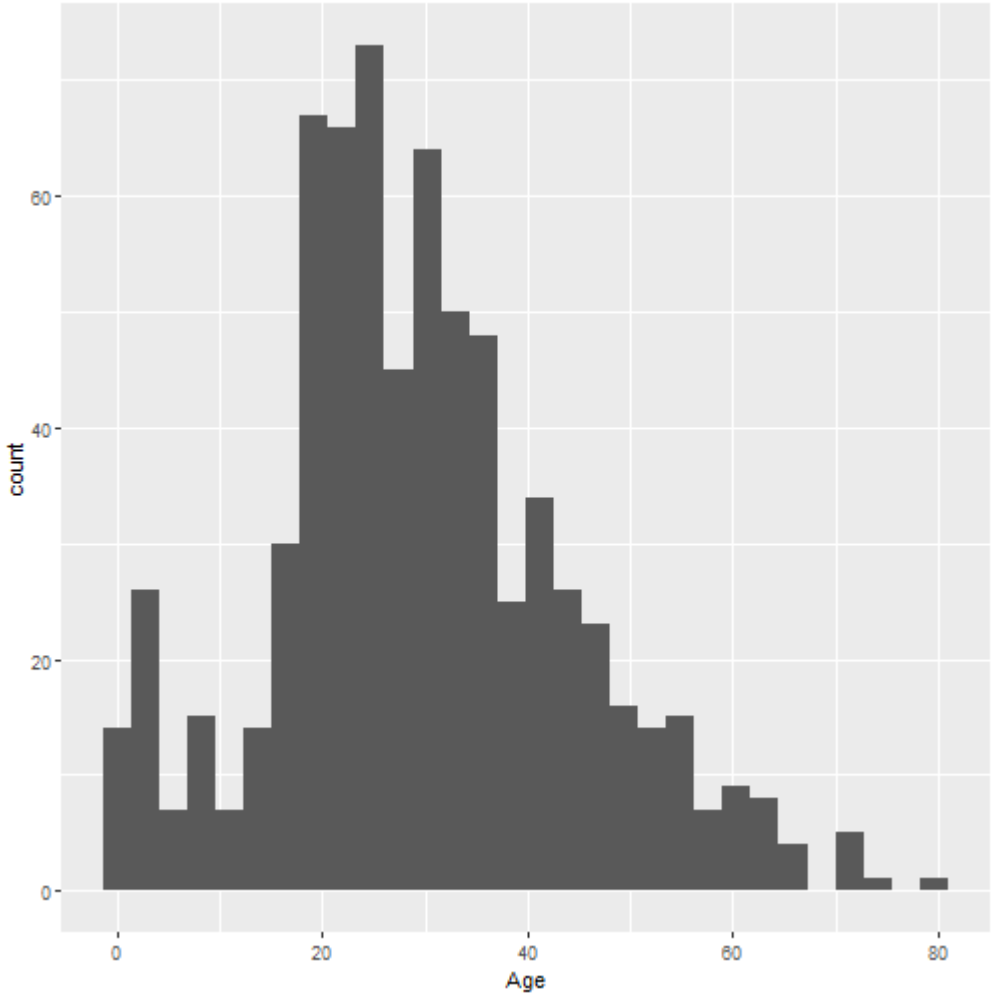
## One Continuous Variable: Density

```
df %>% ggplot()+
  geom_density(mapping = aes(x = Age))
```



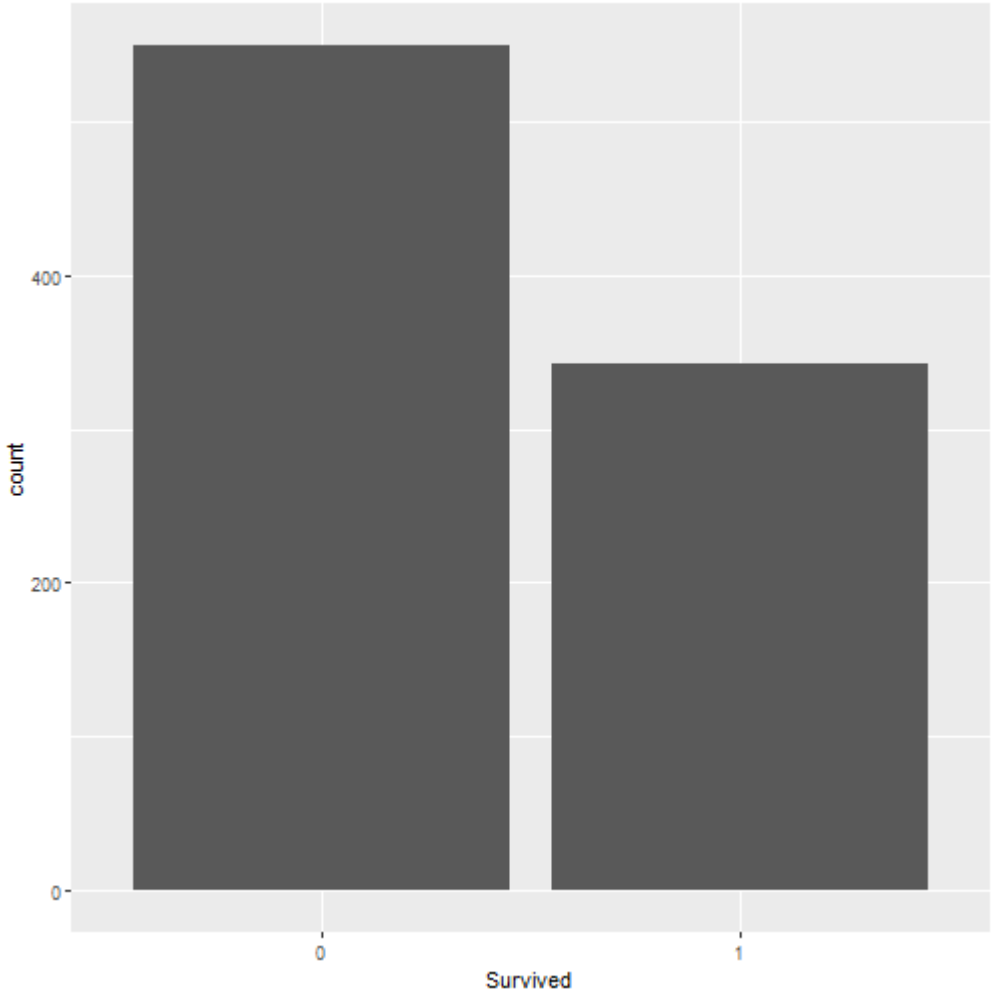
## One Continuous Variable: Histogram

```
df %>% ggplot()+
  geom_histogram(mapping = aes(x = Age))
```



## One Categorical Variable: Bar chart

```
df %>% ggplot()+
  geom_bar(mapping = aes(x = Survived))
```

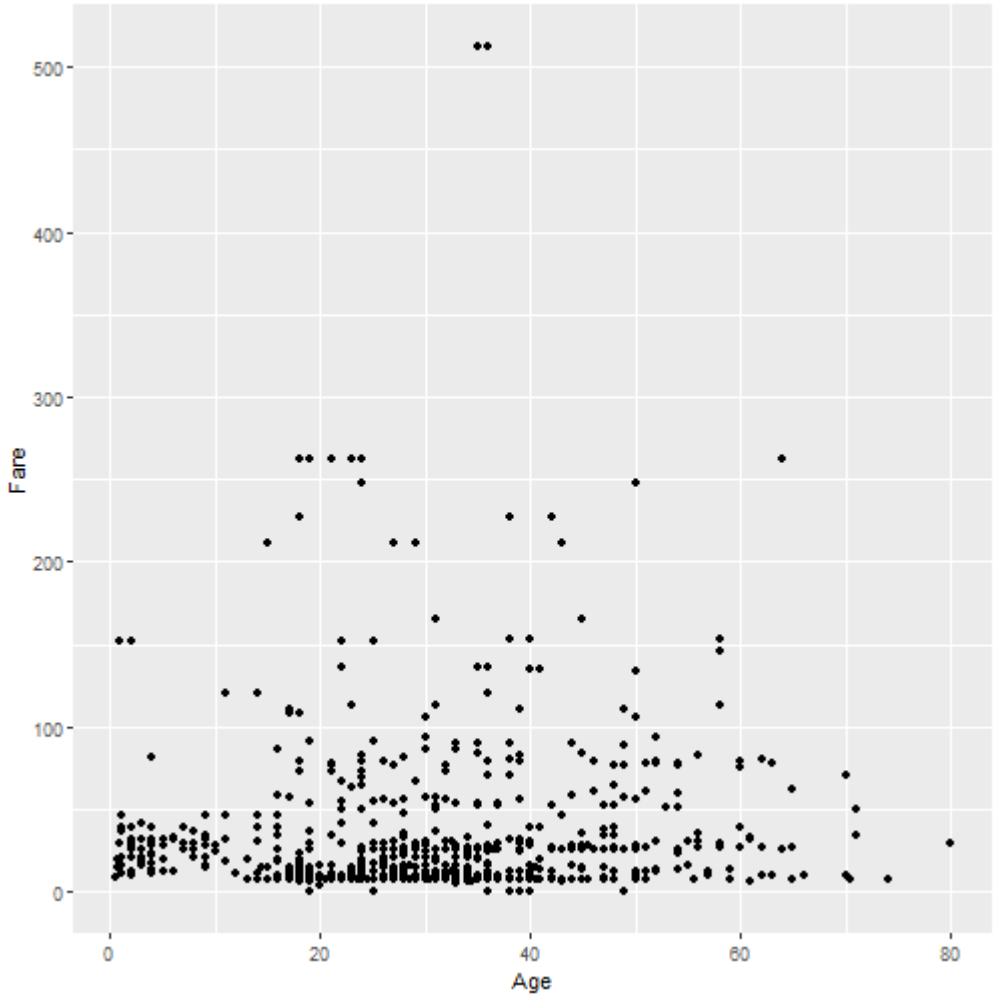


# Two Continuous Variables

- Scatter Plot: `geom_point`
- Line Plot: `geom_line`
- Smooth Plot: `geom_smooth`

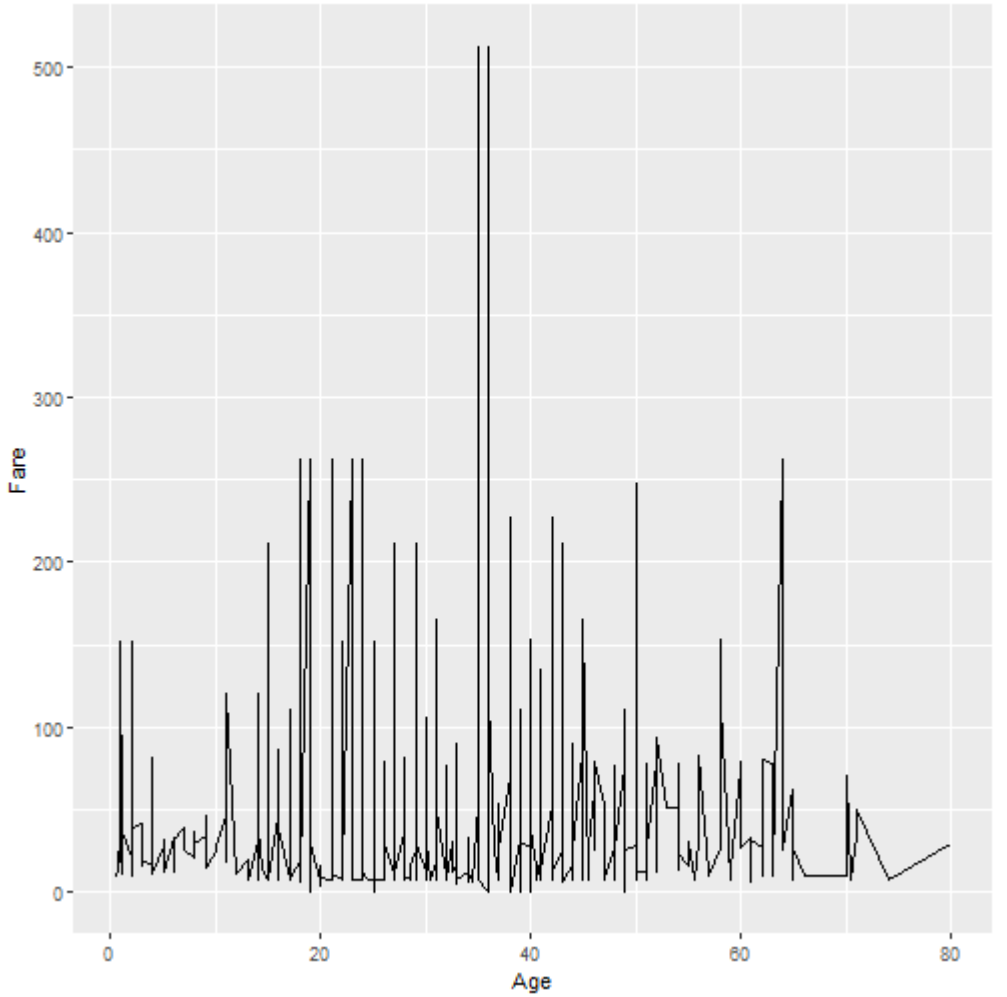
## Two numeric: Scatter Plot: `geom_point`

```
df %>% ggplot()+geom_point(aes(x=Age, y=Fare))
```



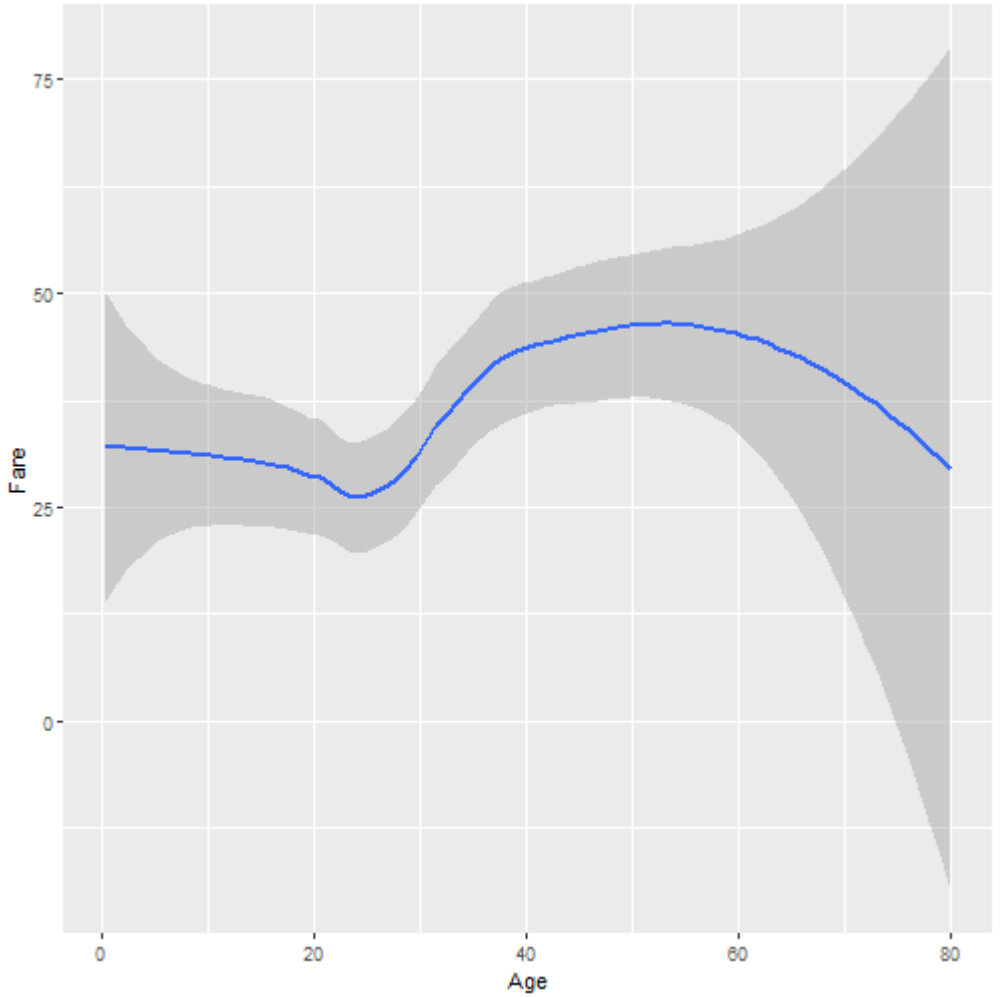
## Two numeric: Line Plot: `geom_line`

```
df %>% ggplot()+geom_line(aes(x=Age, y=Fare))
```



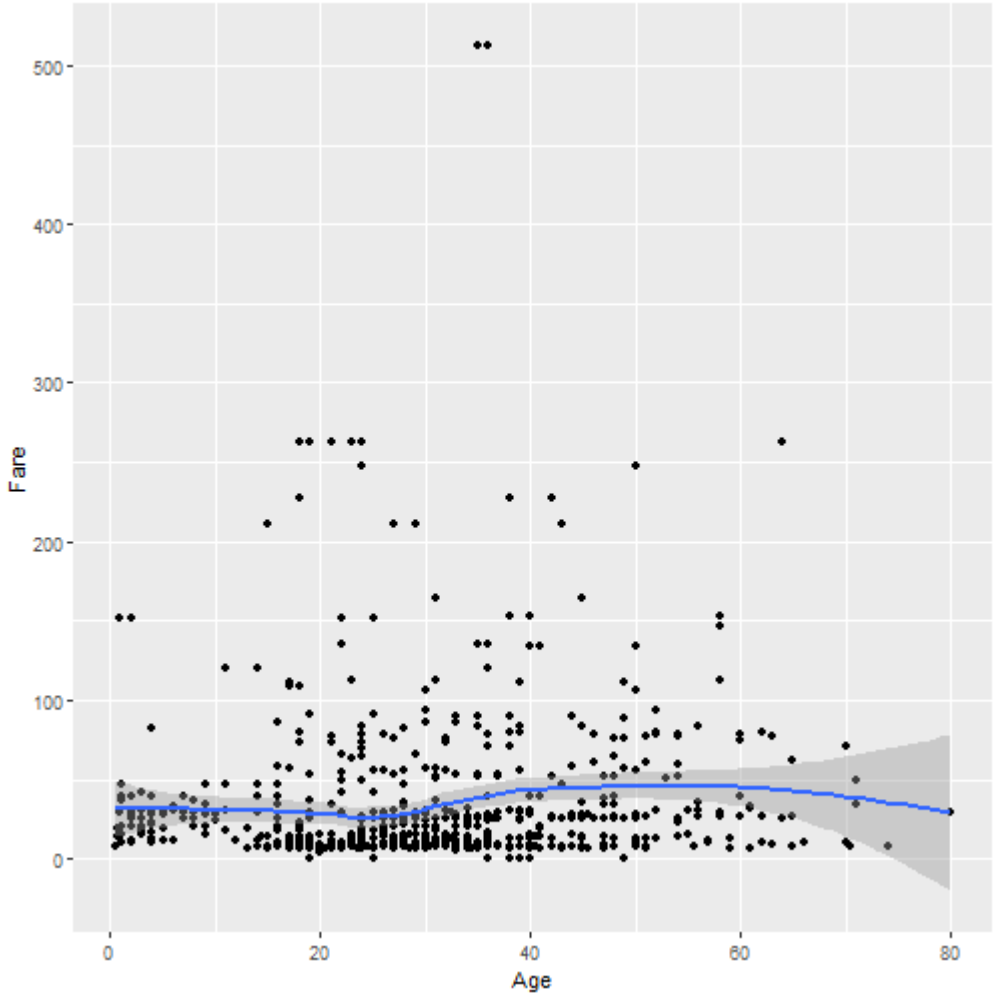
## Two numeric: Smooth Plot: `geom_smooth`

```
df %>% ggplot()+geom_smooth(aes(x=Age, y=Fare))
```



## Two numeric: geom_point + geom_smooth

```
df %>% ggplot() + geom_point(aes(x=Age, y=Fare))+
  geom_smooth(aes(x=Age, y=Fare))
```

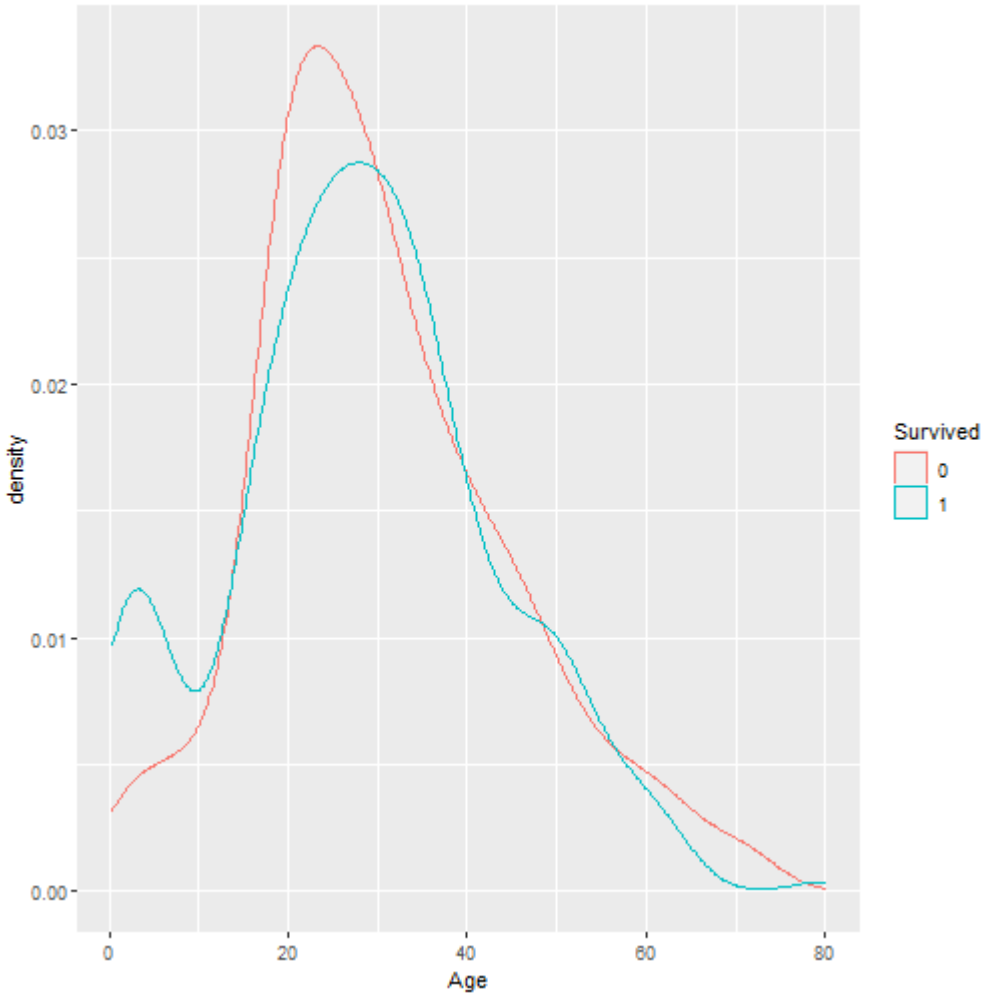


# One Continuous Variable + One Categorical Variable

- Density
- BoxPlot

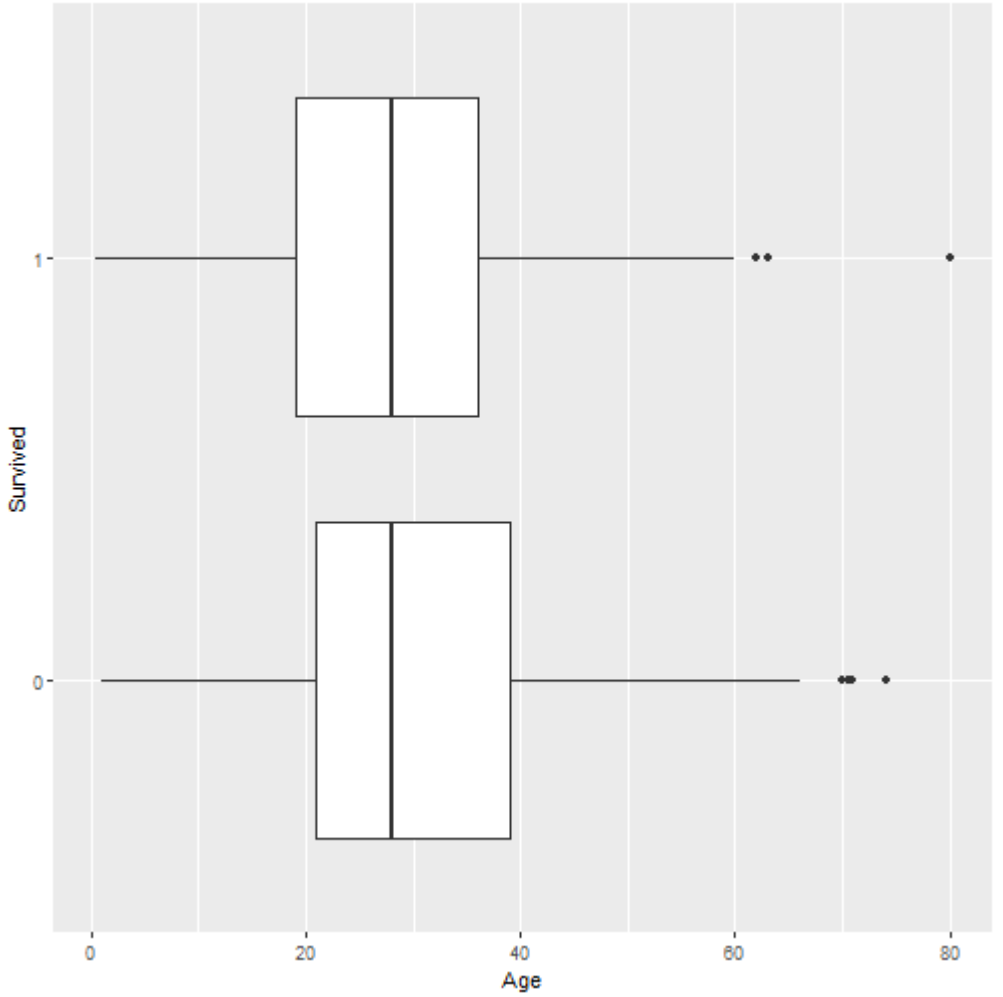
## One Continuous + One Categorical: Density

```
df %>% ggplot()+
  geom_density(mapping = aes(x = Age, color = Survived))
```



## One Continuous + One Categorical: Boxplot

```
df %>% ggplot()+
  geom_boxplot(mapping = aes(x = Age, y = Survived))
```

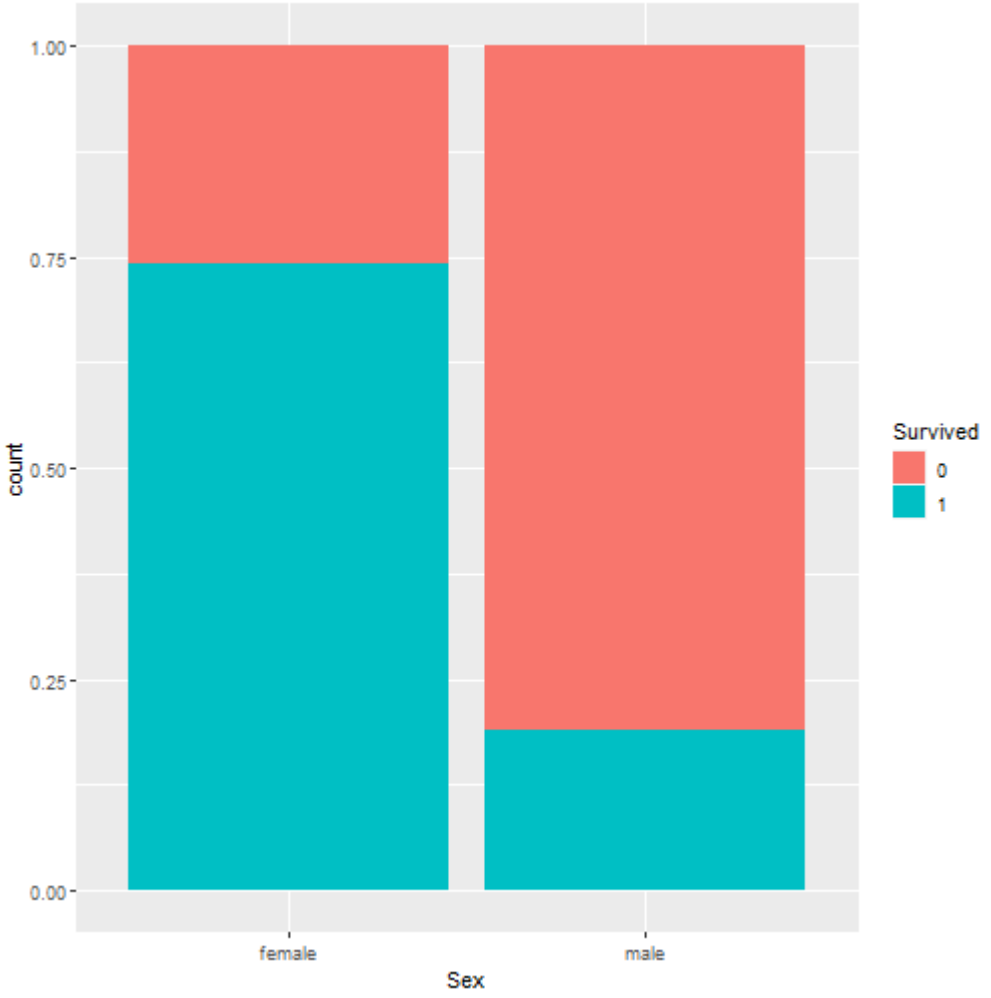


# Two categorical variables

- Barplot

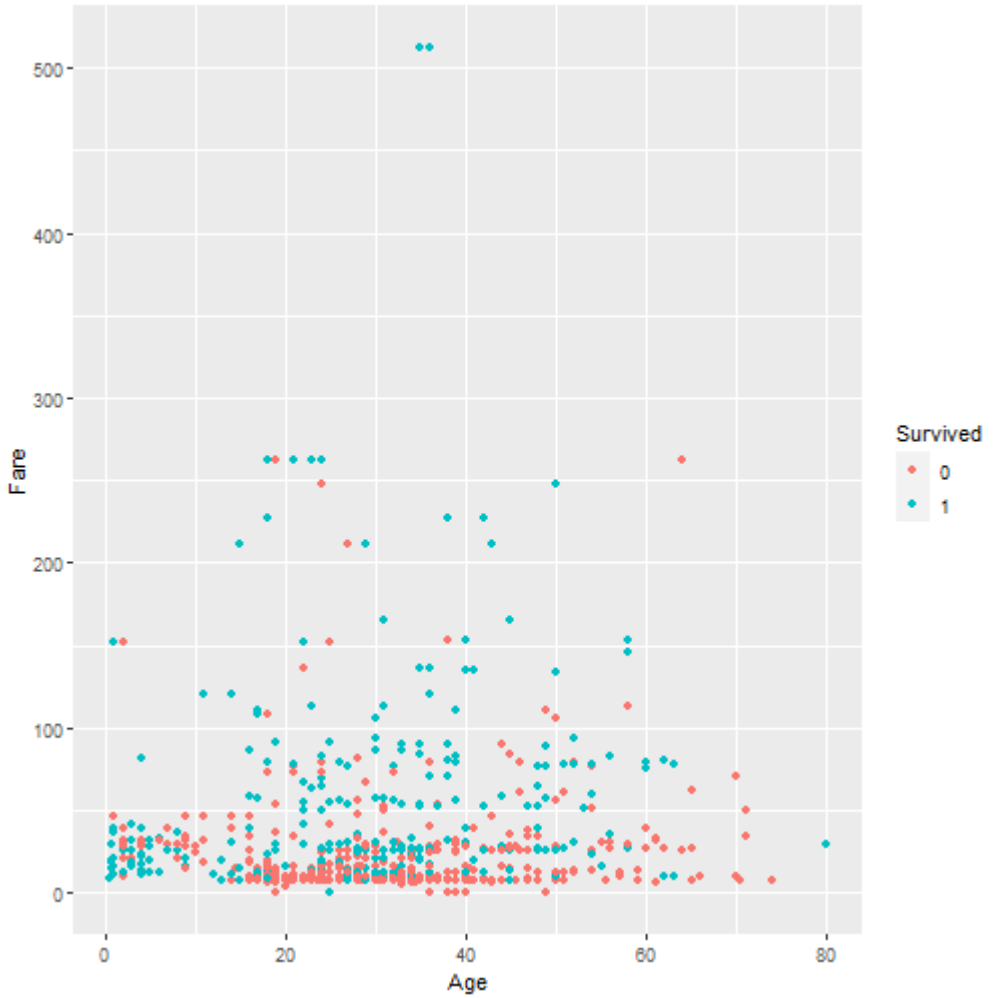
## Two categorical variables: Barplot

```
df %>% ggplot()+
  geom_bar(mapping=aes(x=Sex, fill=Survived), position = 'fill')
```



## Three variables

```
df %>% ggplot() + geom_point(aes(x=Age, y=Fare, color = Survived))
```



# More

- ggplot cheat sheet