

Cheatsheet: R Data Visualization using ggplot2

basics

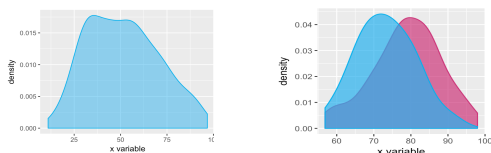
```
ggplot(data, aes(xvar, yvar))
```

This is creating the coordinate system for the plot.
All plots must start with this. Once you have the coordinate system, you need to add a "geom"

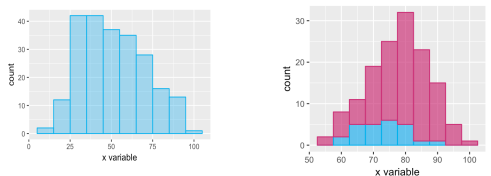
geoms: exploratory

```
a <- ggplot(data, aes(var))
```

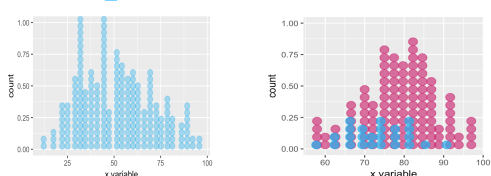
```
a + geom_density()
```



```
a + geom_histogram(binwidth=10)
```



```
a + geom_dotplot(binwidth=10)
```



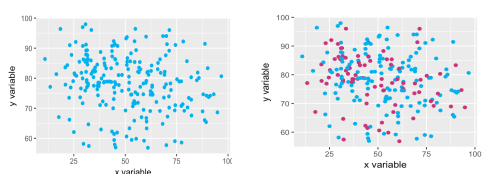
geoms: two variables

```
b <- ggplot(data, aes(xvar, yvar))
```

x var = continuous; y var = continuous

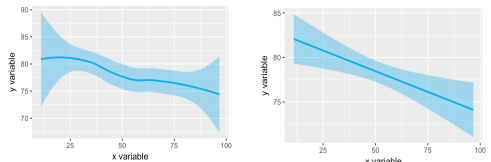
```
b + geom_point()
```

```
b + geom_point(color=factvar)
```



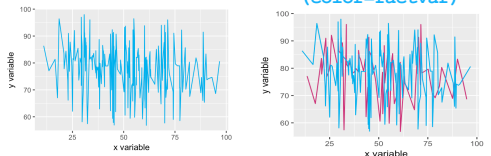
```
b + geom_smooth()
```

```
b + geom_smooth(method=lm)
```



```
b + geom_line()
```

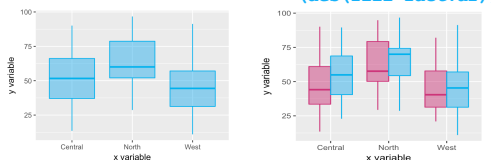
```
b + geom_line(color=factvar)
```



x var = discrete; y var = continuous

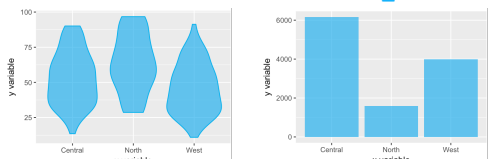
```
b + geom_boxplot()
```

```
b + geom_boxplot(aes(fill=factvar))
```



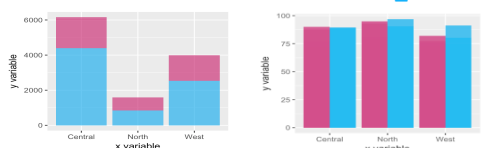
```
b + geom_violin()
```

```
b + geom_bar()
```



```
b + geom_bar(stat = "identity")
```

```
b + geom_bar(stat = "identity", position = position_dodge())
```



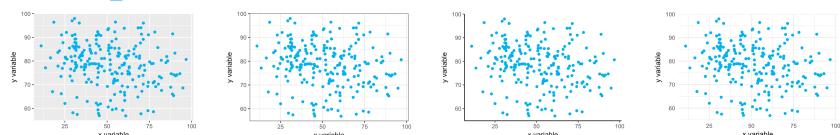
themes

```
+ theme_grey()
```

```
+ theme_bw()
```

```
+ theme_classic()
```

```
+ theme_minimal()
```



theme options

you can modify individual parts of a theme, such as:

```
theme(title, axis.text.x, axis.text.x.top, axis.text.y, axis.text.y.right, axis.ticks, axis.ticks.x, axis.ticks.y, axis.ticks.length, axis.line, axis.line.x, axis.line.y, panel.grid, panel.grid.major, panel.grid.minor, panel.grid.minor.x, panel.grid.minor.y, panel.background, plot.background)
```

```
element_text
```

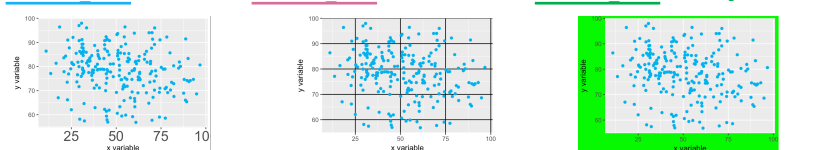
```
element_line
```

```
element_rect
```

```
a + theme(axis.text.x = element_text(size=20))
```

```
a + theme(panel.grid.major = element_line(color="black"))
```

```
a + theme(plot.background = element_rect(fill="green"))
```



labels + titles

```
+ xlab("x axis title")
```

```
+ ylab("y axis title")
```

```
+ ggtitle("a nice title")
```

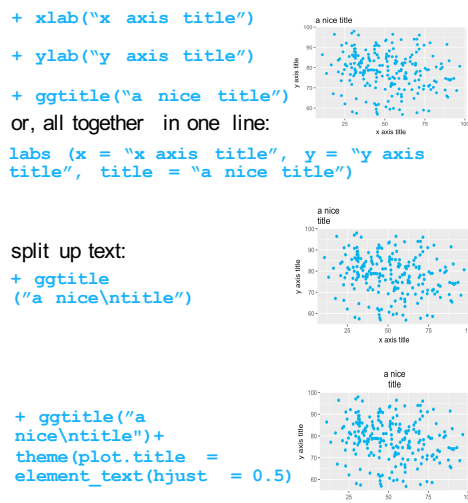
or, all together in one line:

```
labs(x = "x axis title", y = "y axis title", title = "a nice title")
```

split up text:

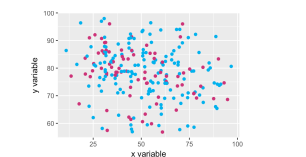
```
+ ggtitle("a nice\n\ttitle")
```

```
+ ggtitle("a nice\n\ttitle") + theme(plot.title = element_text(hjust = 0.5))
```

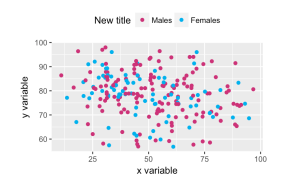


legends

```
+ theme(legend.position = "none")
```



```
+ scale_color_manual(name = "New title", breaks = c("M", "F"), labels = c("Males", "Females")) + theme(legend.position = "top")
```



scales/color

Color palettes:

sequential:

```
gradient
```



qualitative:

```
brewer
```

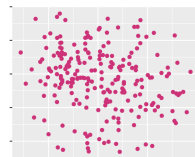


diverging:

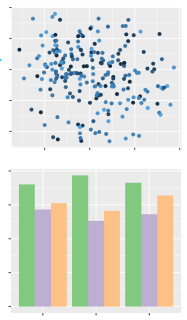
```
gradientn
```



```
+ geom_point(color = "violetred3")
```



```
+ scale_fill_brewer(palette = "Accent")
```

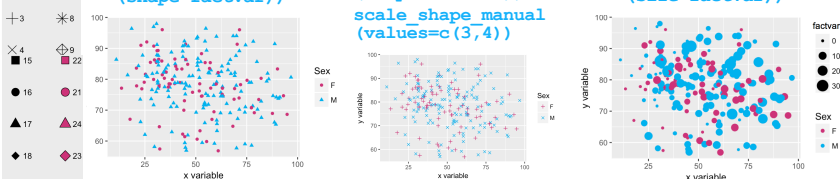


point shapes and sizes

```
+ geom_point(aes(shape=factvar))
```

```
+ geom_point(aes(shape=factvar)) + scale_shape_manual(values=c(3,4))
```

```
+ geom_point(aes(size=factvar))
```



facet grids

```
+ facet_grid(~Ageclass)
```

```
+ facet_grid(Region~.)
```

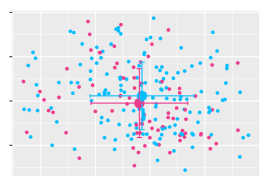
```
+ facet_grid(Region~Ageclass)
```



centroids and error bars (SE)

```
centroids <- aggregate(cbind(x,y)~class,df,mean)  
f <- function(z)sd(z)/sqrt(length(z))  
se <- aggregate(cbind(se.x=x,se.y=y)~class,df,f)  
centroids <- merge(centroids,se, by="class")
```

```
ggplot(gg, aes(x,y,color=factor(class)))+geom_point(size=3)+  
geom_point(data=centroids, size=5)+  
geom_errorbar(data=centroids,aes (ymin=yse,ymax=y+se.y),width=0.1)+  
geom_errorbarh(data=centroids,aes (xmin=x-se.x,ymax=x+se.x),height=0.1)
```



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