Becoming a visualization ninja with ggplot2

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Elements of a ggplot2 plot

Element	Code	Use
data	**data =**	Raw data for plotting
geometries:	**geom_<type>**	Shapes to represent the data
aesthetics:	**aes()**	Aesthetics of the geoms and stats – control color, size, shape, position, etc and how it is mapped to underlying data
scales	**scale_**	Maps the coordinate system for the geoms
Additional Customizations	**theme**	Control axis, background, tick settings (size, color, etc)

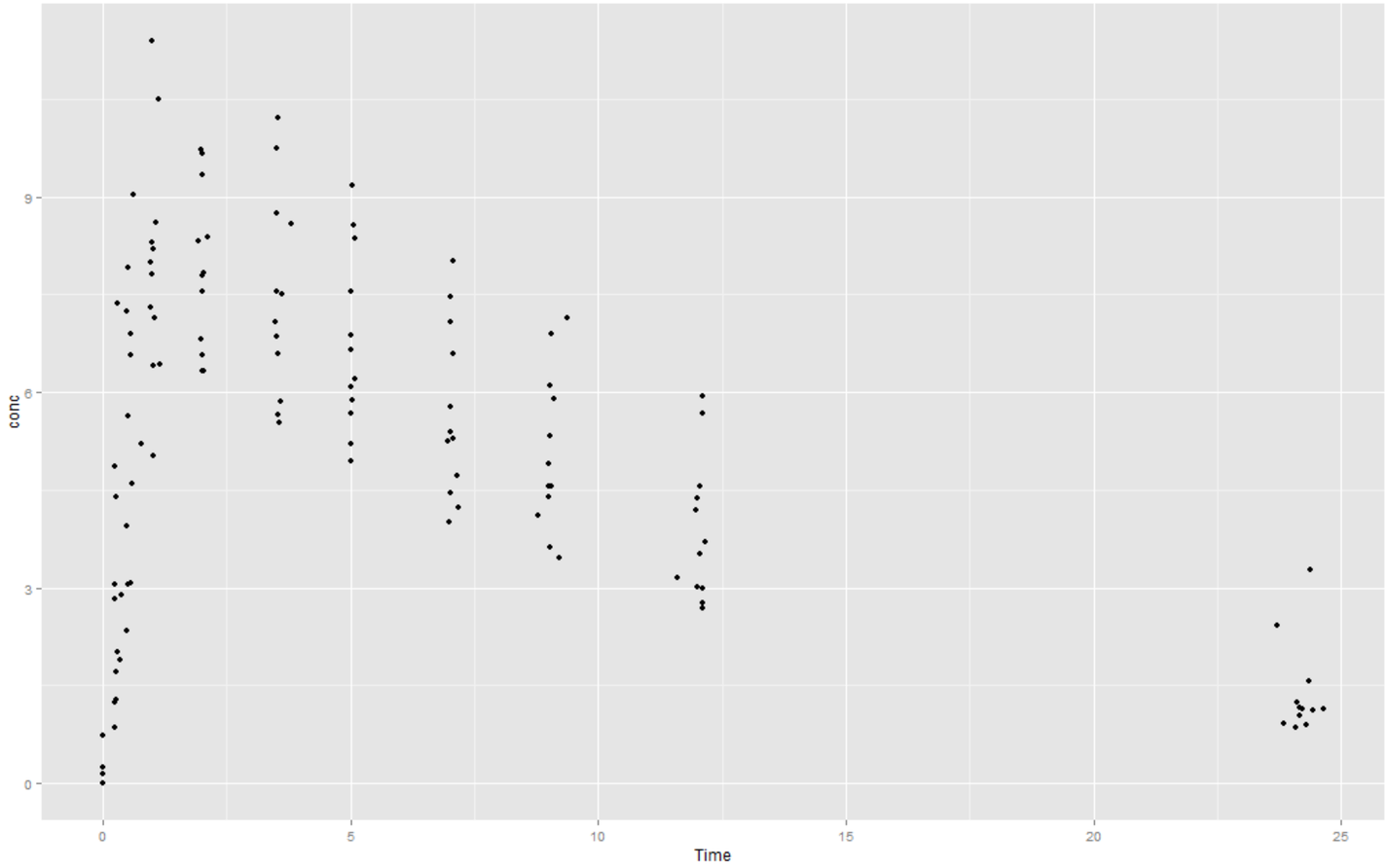
```
ggplot(data=Theoph, aes(x = Time, y = conc))
```

Underlying data

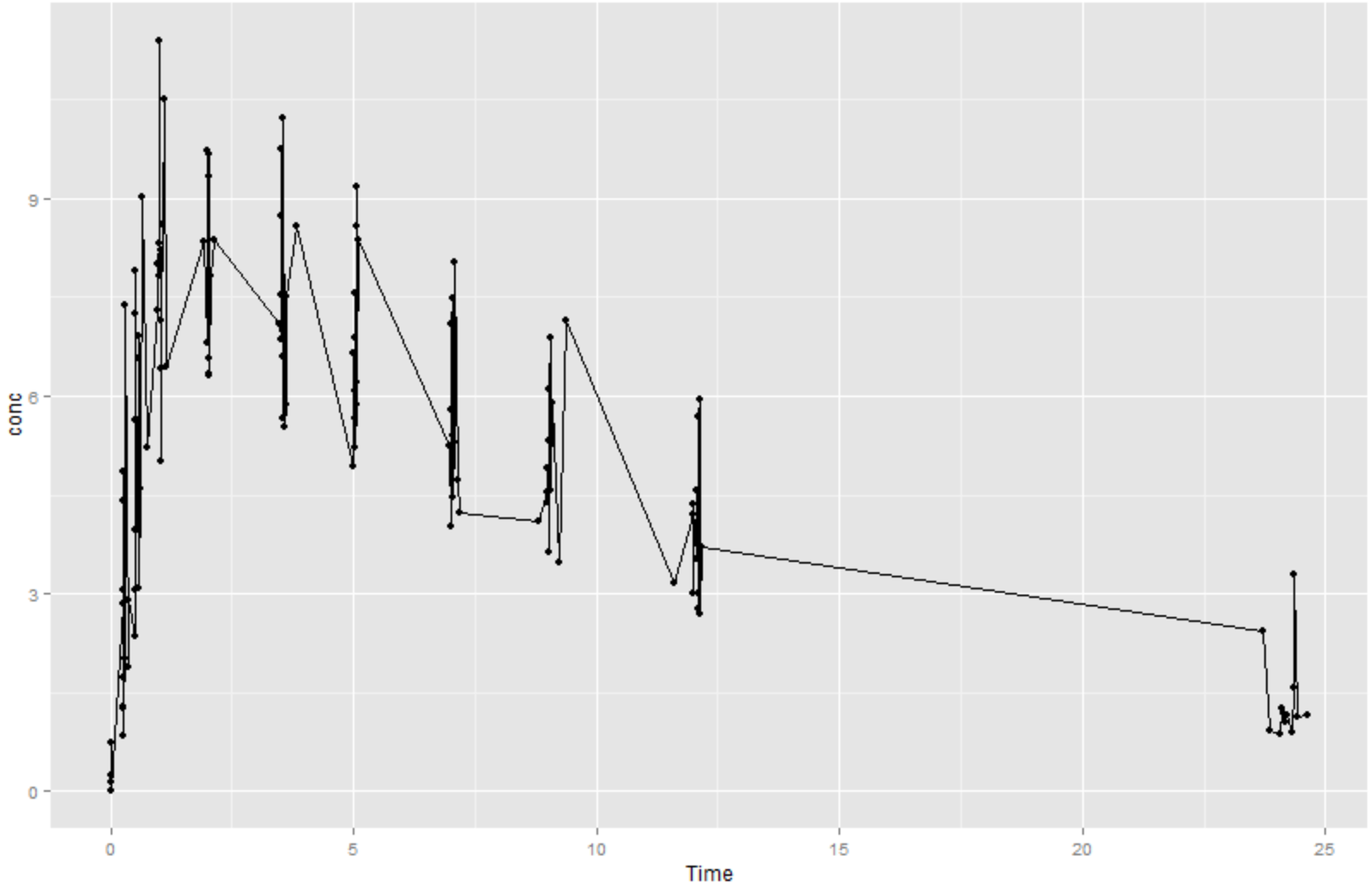
Data columns and their associated ‘mappings’

```
> head(Theoph)
   Subject   Wt Dose Time   conc
1        1 79.6 4.02 0.00  0.74
2        1 79.6 4.02 0.25  2.84
3        1 79.6 4.02 0.57  6.57
4        1 79.6 4.02 1.12 10.50
5        1 79.6 4.02 2.02  9.66
6        1 79.6 4.02 3.82  8.58
```

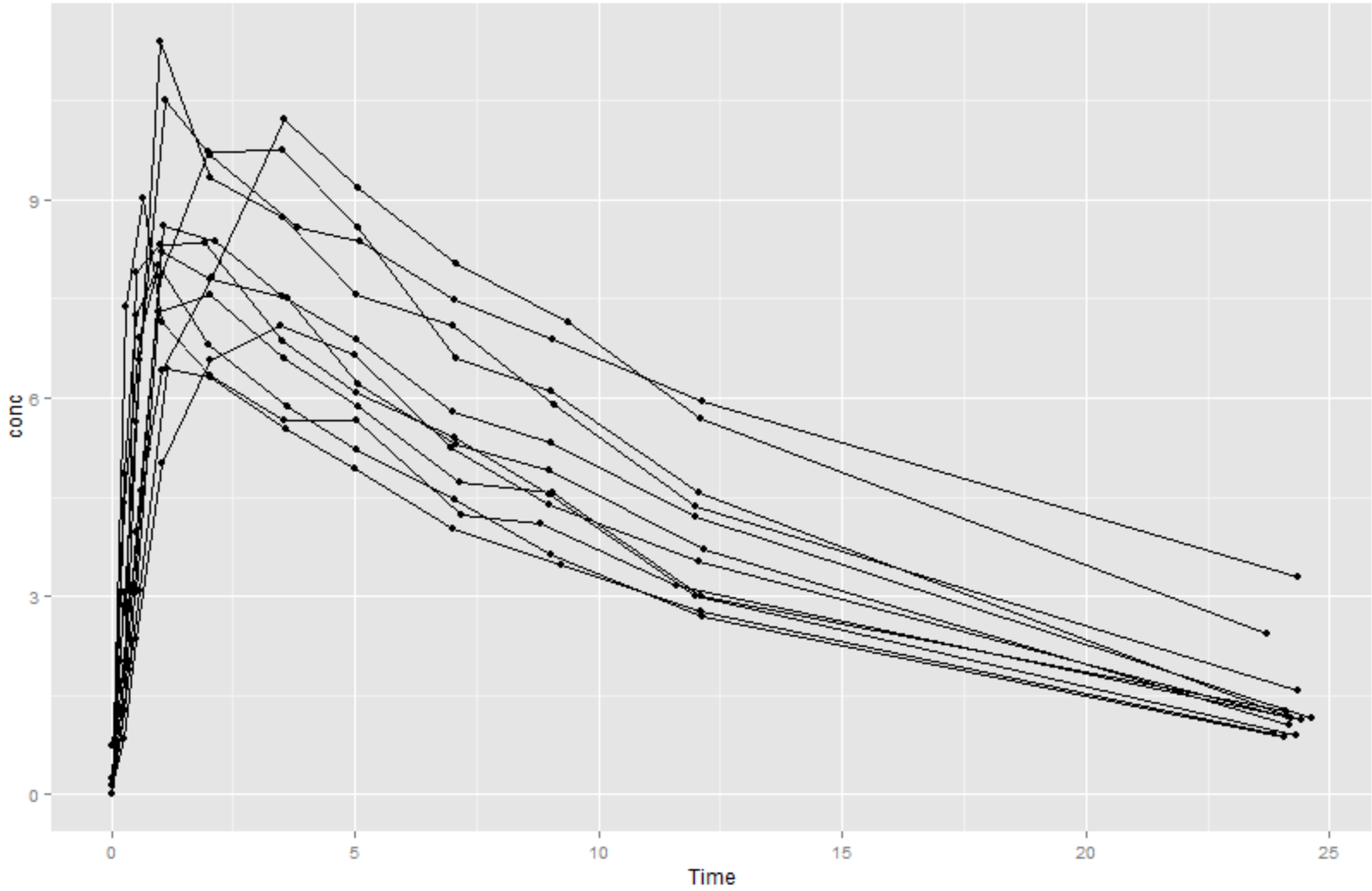
ggplot(data=Theoph, aes(x = Time, y = conc)) + geom_point()



```
ggplot(data=Theoph, aes(x = Time, y = conc)) +
geom_point() + geom_line()
```

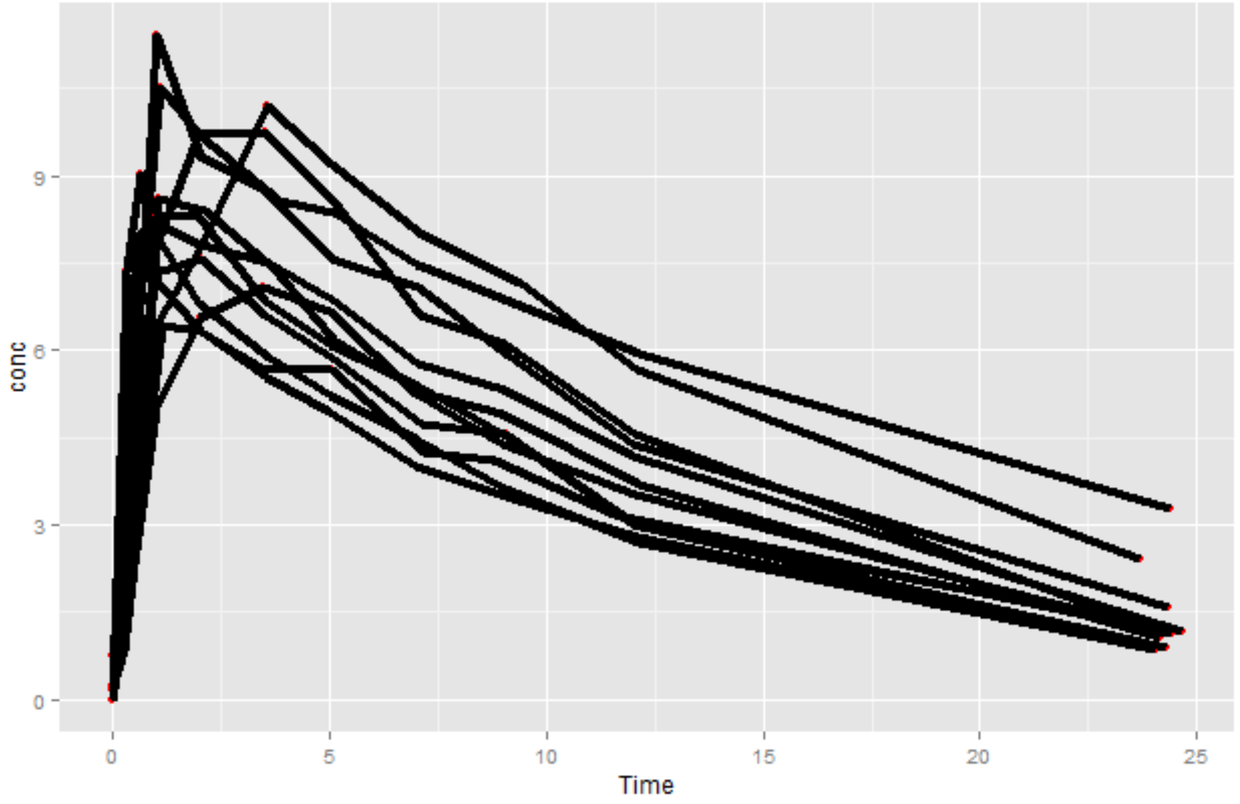


```
ggplot(data=Theoph, aes(x = Time, y = conc, group = Subject))
+ geom_point() + geom_line()
```

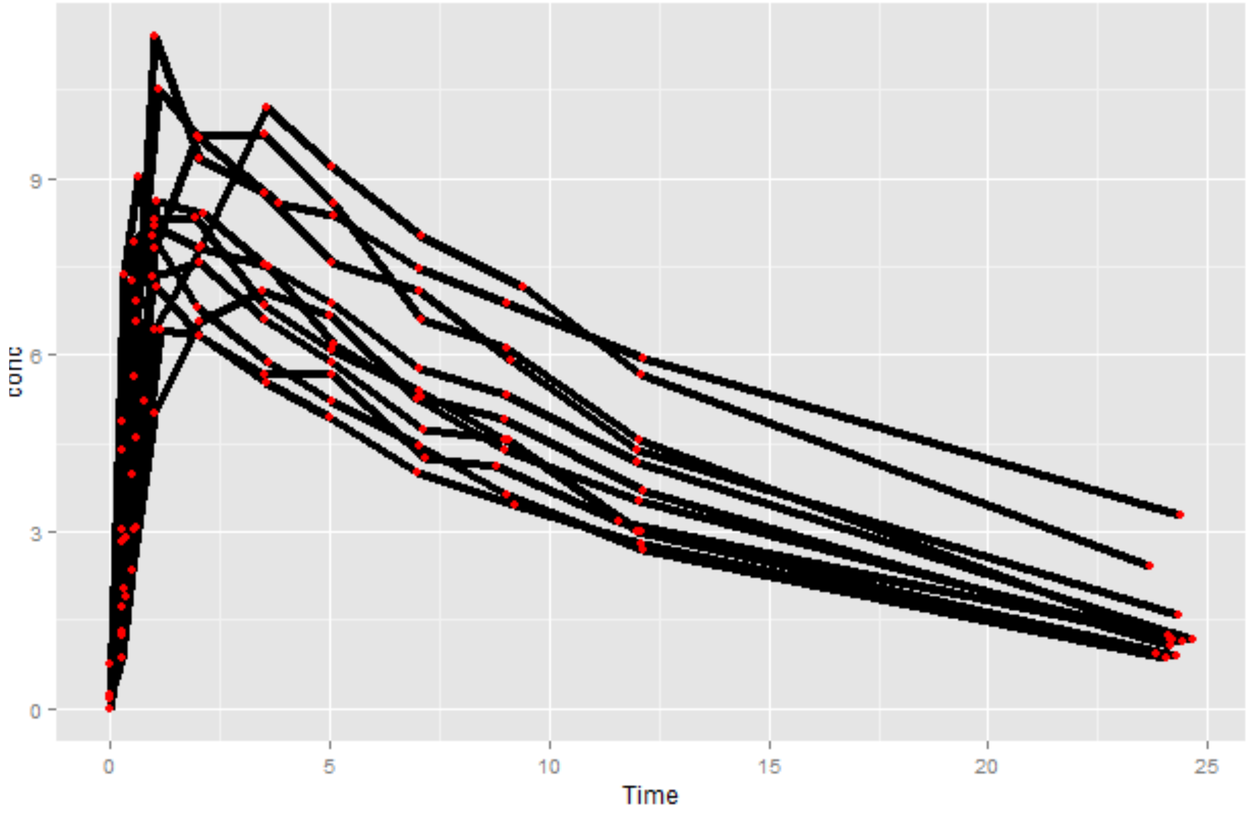


Order matters visually!

```
ggplot(data = Theoph, aes(x = Time, y = conc,
group = Subject)) +
geom_point(color = 'red') +  geom_line(size = 1.5)
```



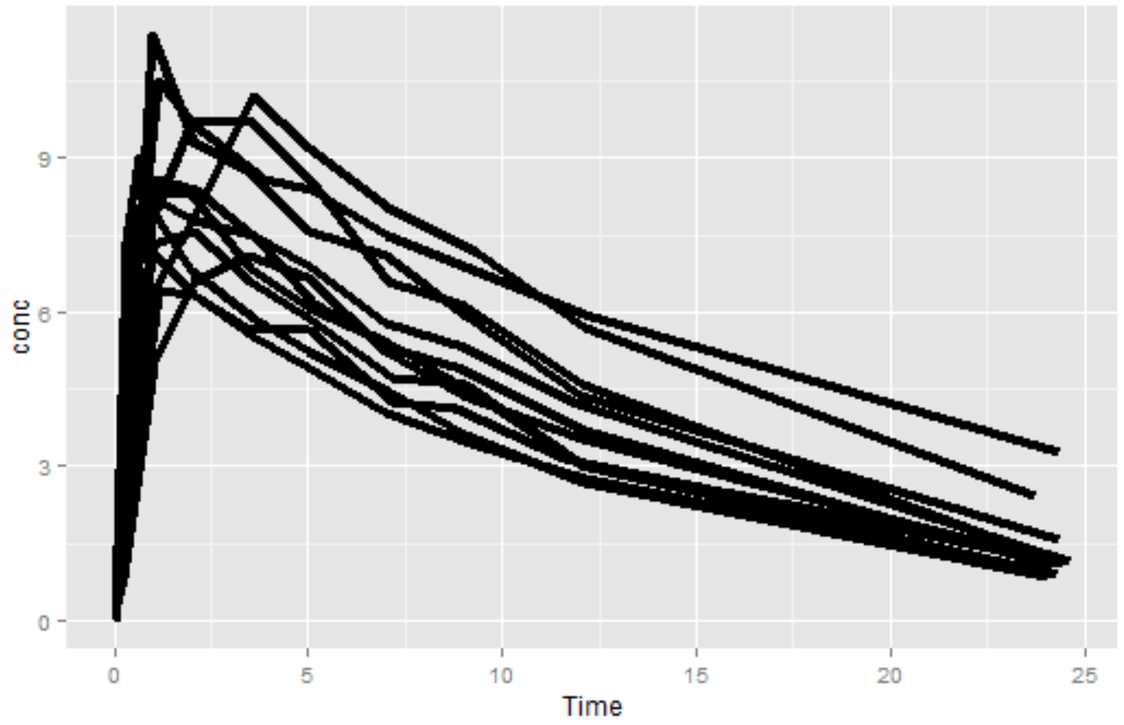

```
ggplot(data = Theoph, aes(x = Time, y = conc,
group = Subject)) +
geom_line(size = 1.5) + geom_point(color = 'red')
```



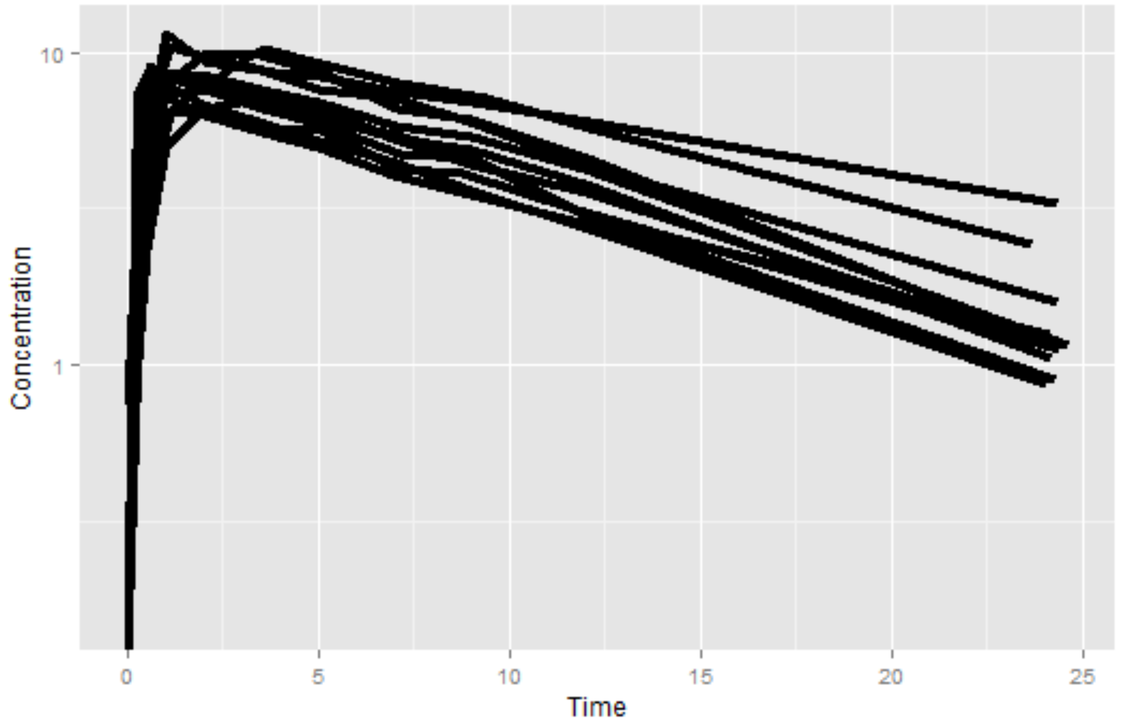
Objects can be saved and more layers added

```
conc_time <- ggplot(data = Theoph, aes(x = Time, y = conc, group = Subject)) +  geom_line(size = 1.5)
```

conc_time



conc_time + scale_y_log10() + ylab("Concentration")



```
ggplot(data=Theoph, aes(x = Time, y = conc, group = Subject))
+ geom_line(size = 1.5) +
theme(axis.text.x = element_text(size = 20, color = 'black'))
```