How can I make spaghetti plots in R?

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Spaghetti plots, also known as line plots or time series plots, are graphical representations showing the relationship between two or more variables over time. In R, they can be easily created using the "plot" function, with the x-axis representing time and the y-axis representing the values of the variables. To add multiple lines to the plot, the "lines" function can be used. Customizations such as labeling, color-coding, and adding titles can also be done to enhance the visual presentation of the plot. Furthermore, R offers various packages, such as ggplot2 and lattice, that provide more advanced and customizable options for creating spaghetti plots. With its powerful and versatile plotting capabilities, R is a great tool for creating informative and visually appealing spaghetti plots.

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Function interaction.plot can be used to make spaghetti plots. Let's use data set tolerance_pp.csv used in Applied Longitudinal Data Analysis: Modeling Change and Event Occurrence by Judith D. Singer and John B. Willett for our example.

```
tolerance<-
read.table("https://stats.idre.ucla.edu/stat/r/faq/tolpp.csv",
sep=",", header=T)
head(tolerance, n=10)
```

```
id age tolerance male exposure time
1 9 11 2.23 0 1.54 0
2 9 12 1.79 0 1.54 1
3 9 13 1.90 0 1.54 2
```

4 9 14 2.12 0 1.54 3

5 9 15 2.66 0 1.54 4

6 45 11 1.12 1 1.16 0

7 45 12 1.45 1 1.16 1

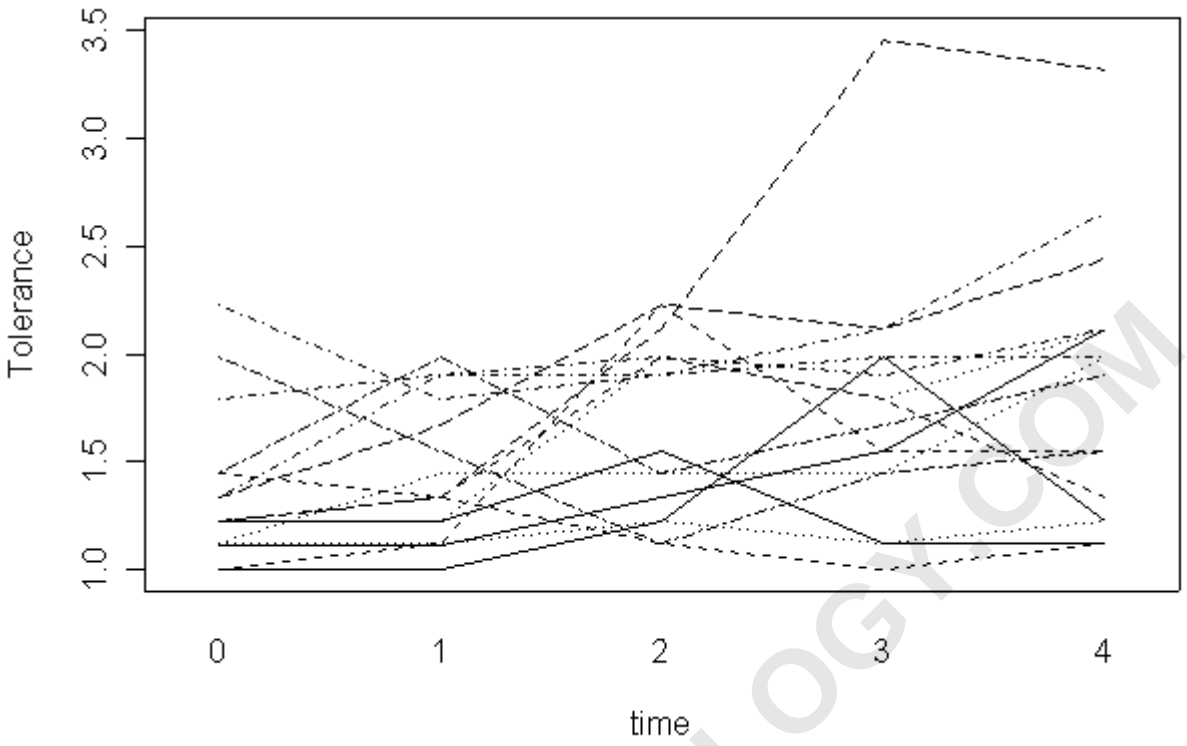
8 45 13 1.45 1 1.16 2

9 45 14 1.45 1 1.16 3

10 45 15 1.99 1 1.16 4

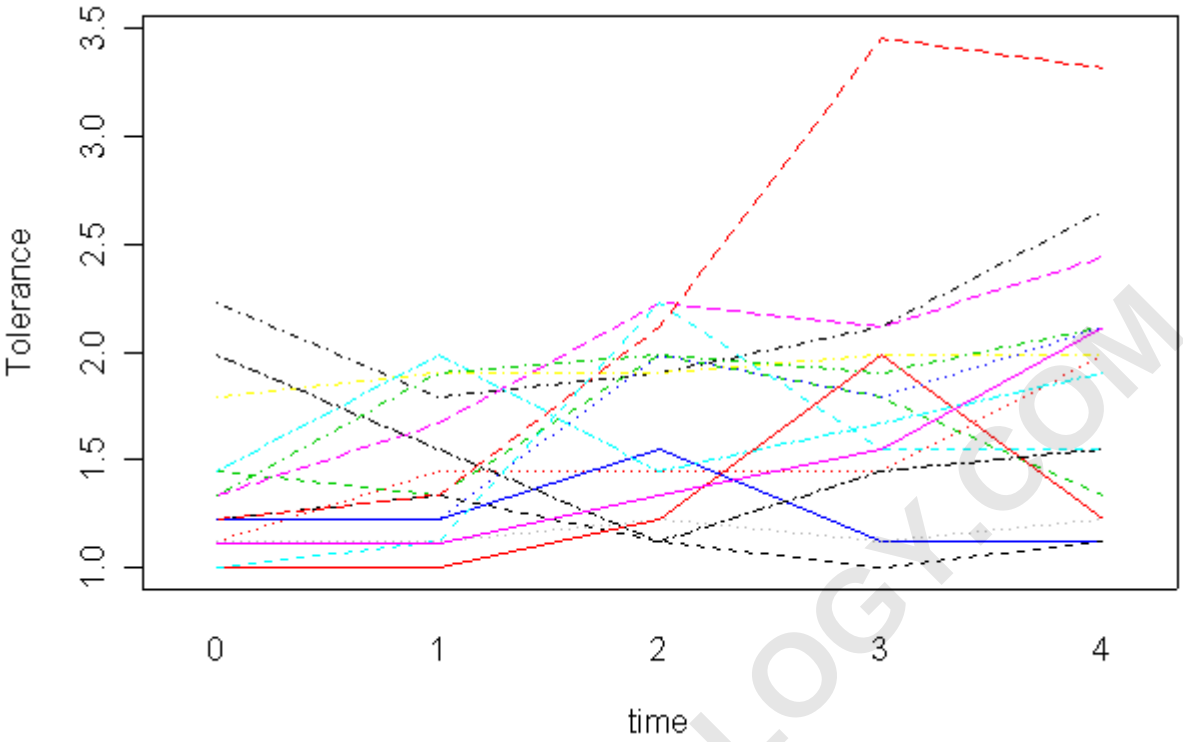
Each subject has been observed at five time points. We will plot the outcome variable tolerance against time for each subject.

```
interaction.plot(tolerance$time, tolerance$id, tolerance$tolerance, xlab="time", ylab="Tolerance", legend=F)
```



We can also use different colors for different lines.

```
interaction.plot(tolerance$time,
tolerance$id, tolerance$tolerance,
xlab="time", ylab="Tolerance", col=c(1:10), legend=F)
```



Here is a more involved example. We will make a spaghetti plot of linear trend for each subject.
First we create an object of fitted values for each subject. The function by is quite handy for this type of task. The first argument is the entire data set, the second argument is the group id variable (the by variable), and the third argument is the function to apply to each group. Here we define the function on-the-fly to be the fitted value from the linear regression of variable tolerance on time. Each value of variable id yields a sub data set for the regression function and this has to be the argument for this

function.

The function unlist converts the list object fit into a vector object and we will have to get rid of the names for it by assign NULL to its names.

```
#fitting the linear model by id
fit <- by(tolerance, tolerance$id,
function(x) fitted.values(lm(tolerance ~
time, data=x)))

fit1 <- unlist(fit)
names(fit1) <- NULL
#plotting the linear fit by id
interaction.plot(tolerance$time, tolerance$id, fit1,
xlab="time", ylab="tolerance", legend=F)
```