

MIE237 March 1-2 Labs

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For this week and next you'll spend most of your computing time on the assignment, but there are also a few things to keep up with.

The new regression material from the past week included the F distribution business, R^2 , confidence intervals and prediction intervals. The F and R^2 business was already being produced in the R code you've been using already, so there's nothing more to do.

That leaves us with estimating mean response and confidence intervals and predicting new values and prediction intervals. This can be done very quickly and easily with R.

Worked example using exercise 11.57 data

Here's how I would go about obtaining the basic regression fit itself.

```
library(rio)
library(dplyr)

fitness <- import("Ex11.57.txt")

fitness %>%
  lm(02 ~ Time, data = .) -> fitness_lm
```

Let's estimate the mean response at time 900 seconds, with a 95% confidence interval. Let's also predict the response at time 800 seconds, with a 95% prediction interval.

Everything we need is in single function `predict.lm`. The trickiest part is in how to tell it what the "new" x values are. This must be done using a `data.frame` with a variable name the same as in the original data, as follows:

```
new_times <- data.frame(Time = c(800, 900))
```