Stat 145, Thu 29-Apr-2021 -- Thu 29-Apr-2021
Biostatistics
Spring 2021

Thursday, April 29th 2021

Due::   WW regressionInference due at 11 pm

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Wk 13, Th
Topic:: Regression extensions

Here are the contents of my R script file used in class today

```
#Transformed data
un <- read.csv("http://users.stat.umn.edu/~sandy/alr4ed/data/UN11.csv")
head(un)
gf_point(lifeExpF ~ log(ppgdp), data=un) %>% gf_lm()
# try something else
lm(lifeExpF ~ log(ppgdp), data=un) -> lmLifeLogGdp
summary(lmLifeLogGdp)


#Multiple regression
gf_point(lifeExpF ~ fertility, data=un)
lmLifeFertility <- lm(lifeExpF ~ fertility, data=un)
summary(lmLifeFertility)
lmLifeGdpFertility <- lm(lifeExpF ~ log(ppgdp) + fertility, data=un)
summary(lmLifeGdpFertility)
# interval when  ppgdp=800, fertility=3
lifeExpPredictor <- makeFun(lmLifeGdpFertility)
lifeExpPredictor(ppgdp=800, fertility=3, interval="confidence")
anova(lmLifeGdpFertility)


#Polynomial regression
require(MASS)
data(Boston)
gf_point(medv ~ lstat, data=Boston) %>% gf_lm()
```

```
lmLine <- lm(medv ~ lstat, data=Boston)
summary(lmLine)
plot(lmLine)


# quadratic fit
lm2ndDeg <- lm(medv ~ lstat + I(lstat^2), data=Boston)
summary(lm2ndDeg)
plot(lm2ndDeg)
gf_point(medv ~ lstat, data=Boston) %>%
  gf_fun(42.862-2.33282*x+0.043547*x^2 ~ x, color="red")



# 3rd-degree fit
lm3rdDeg <- lm(medv ~ lstat + I(lstat^2) + I(lstat^3), data=Boston)
summary(lm3rdDeg)
plot(lm3rdDeg)
gf_point(medv ~ lstat, data=Boston) %>%
  gf_fun(48.65-3.8656*x+0.14874*x^2-0.0020039*x^3 ~ x, color="red")


# 4th-degree fit
lm4thDeg <- lm(medv ~ lstat + I(lstat^2) + I(lstat^3) + I(lstat^4), data=Boston)
summary(lm4thDeg)
plot(lm4thDeg)
gf_point(medv ~ lstat, data=Boston) %>%
  gf_fun(57.31-7.028*x+0.4955*x^2-0.01631*x^3+0.0001949*x^4 ~ x, color="red")



# 5th-degree fit
lm5thDeg <- lm(medv ~ lstat + I(lstat^2) + I(lstat^3) + I(lstat^4) + I(lstat^5), data=Boston)
summary(lm5thDeg)
plot(lm5thDeg)
gf_point(medv ~ lstat, data=Boston) %>%
  gf_fun(67.7-11.99*x+1.273*x^2-0.06827*x^3+0.001726*x^4-0.00001632*x^5 ~ x,
  color="red")
```