

## R for Chapters 1-2

### Running List of Functions Applied to the Data Set, class.data:

```
> attach(class.data)

> plot(ht,wt)  ## scatter plot of these two variables using our data

> reg <- lm(wt ~ ht)  ## fits the linear regression model with "wt" explained as a linear function of "ht"

> reg          ## displays the coefficients of the Least Squares Fit

> summary(reg)  ## displays summary information about the fit

> plot(ht,wt)

> abline(lm( wt ~ ht))  ## includes the fitted line on the scatterplot (Leave the previous plot on the screen when doing this.)

> wt          ## the observed response value for each predictor value in the data

> fitted.values(reg)  ## the fitted values (vertical distance to the line) at each predictor value in the data

> residuals(reg)  ## the residual value (observed minus fitted) at each predictor value in the data

> confint(reg)  ## gives 95% C.I. For each of the intercept and the slope in our model

> confint(reg, level=.98)  ## gives a 98% confidence interval for each of the intercept and the slope

> predict(reg, newdata=data.frame(ht=70), se.fit=TRUE, interval="confidence")  ## fitted value at ht=70
## this estimates the average wt at ht=70, includes a 95% confidence interval for this average
## plus the se of this estimate (se.fit) and residual.scale=sqrt(MSE)

> predict(reg, newdata=data.frame(ht=70), se.fit=TRUE, interval="confidence", level=.98)  ## same as previous
## only with 98% confidence interval for the average

> predict(reg, newdata=data.frame(ht=70), se.fit=TRUE, interval="predict")  ## predicted value of a new "wt" at ht=70
## includes a 95% prediction interval for this new response, the se of this predicted new response
## is  $\sqrt{\text{se.fit}^2 + \text{residual.scale}^2}$ , the prediction interval confidence level is changed as
## shown in the previous example.

> anova(reg)  ## provides the ANOVA Table for the analysis of this simple linear model

> cor(ht,wt)  ## gives the Pearson correlation coefficient for the two variables included
```