makingModelMatrix

TLS

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In Exercise 8(e) of Chapter 6, you are asked to fit a model to a tenth degree polynomial of a single predictor X using lasso. Naturally, we will use the glmnet() function as in class, and so we will need a model matrix. You have few examples of how to build a model matrix. This document is intended to provide several examples of how you can build a model matrix in this context.

First, we need X:

```
x = rnorm(100, 11, 2)
y = 2+11.2*x+5.4*x^2+.025*x^3
```

This first approach makes a data frame containing Y, X, and the various powers of X, so that you place yourself in a familiar context in which you have build the model matrix once before.

```
myDat = data.frame(x1=x,x2=x^2,x3=x^3,x4=x^4,x5=x^5,x6=x^6,x7=x^7,x8=x^8,x9=x^9,x10=x^10,y)
xMat = model.matrix(y ~ ., data=myDat)
```

A second approach is to take advantage of a switch to the poly() command:

```
xMat = model.matrix(y ~ poly(x,10,raw=TRUE))[,-1]
```