HW6

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16.1

Elements of a Bugs model: list the elements of the model on page 370 by category: modeled data, unmodeled data, modeled parameters, unmodeled parameters, derived quantities, and looping indexes (as in Figure 16.4).

```
model {
  for (i in 1:n){
    y[i] ~ dnorm (y.hat[i], tau.y)
    y.hat[i] <- a[school[i]] + b*x[i]
  }
  b ~ dnorm (0, .0001)
  tau.y <- pow(sigma.y, -2)
  sigma.y ~ dunif (0, 100)
  for (j in 1:J){
    a[j] ~ dnorm (a.hat[j], tau.a)
    a.hat[j] <- g.0 + g.1*T[j]
  }
  g.0 ~ dnorm (0, .0001)
  g.1 ~ dnorm (0, .0001)
  tau.a <- pow(sigma.a, -2)
  sigma.a ~ dunif (0, 100)
}
```

- modeled data - y
- unmodeled data - x, T
- modeled parameters - a
- unmodeled parameters - b, sigma.y, g.0, g.1, sigma.a
- derived quantities - y.hat, tau.y, a.hat, tau.a
- looping indexes - i,j

16.2

I have corrected the errors in the code below,

```
model { #Bugs code
  for (i in 1:n){
    y[i] ~ dnorm (yhat[i], tau.y)
    yhat[i] <- a[state[i]] + theta*treat[i] + b*hispanic
  }
  theta ~ dnorm (0, .0001)
  b ~ dnorm (0, 1000)
  tau.y <- pow (sigma.y, -2)
  sigma.y <- dunif (0, 100)
  for (j in 1:J){
    a[j] ~ rnorm (mu.a, tau.a^2)
```

```
  }
  mu.a ~ dnorm (0, .0001)
  tau.a <- pow (sigma.a, -2)
  sigma.a ~ dunif (0, 100)
}
```