Stat 5421 (Geyer) Spring 2016
Homework Assignment 5
Due Friday, May 6, 2016

Problem 5.1. The data are the data in Table 10.9 in Agresti. These data can be read into R as follows

```
> foo <-
+     read.table(url("http://www.stat.umn.edu/geyer/5421/data/table-10.9.txt"),
+         header = TRUE)
> sapply(foo, class)
```

```
 survival gestation   smoking       age    counts
 "factor"  "factor"  "factor"  "factor" "integer"
```

(a) Which hierarchical model has the lowest AIC?

(b) which hierarchical models have the lowest AIC and have Akaike weights adding up to 0.95?

(c) Which models listed in part (b) are graphical?

(d) Which graphical model has the lowest AIC?

(e) Which graphical models have the lowest AIC and have Akaike weights adding up to 0.95?

(f) For the five graphical models with the lowest AIC, draw the graphs and interpret them by giving the implied conditional independence relationships

In all parts it may be helpful to know that the result of `summary.glmbb` is a list, the `results` component of which is the printed data frame. For example

```
gout <- glmbb(...)
sout <- summary(gout)
```

then `sout$results$criterion` is the vector of criteria (AIC, BIC, or AICc, as the case may be), `sout$results$weight` is the vector of weights, and `sout$results$formula` is the vector of formulas expressed as character strings. The R function `as.formula` converts one character string to a formula. The R function `isGraphical` in the R package `glmbb` tells whether a formula corresponds to a graphical model.