Statistics 135 – Lab Project

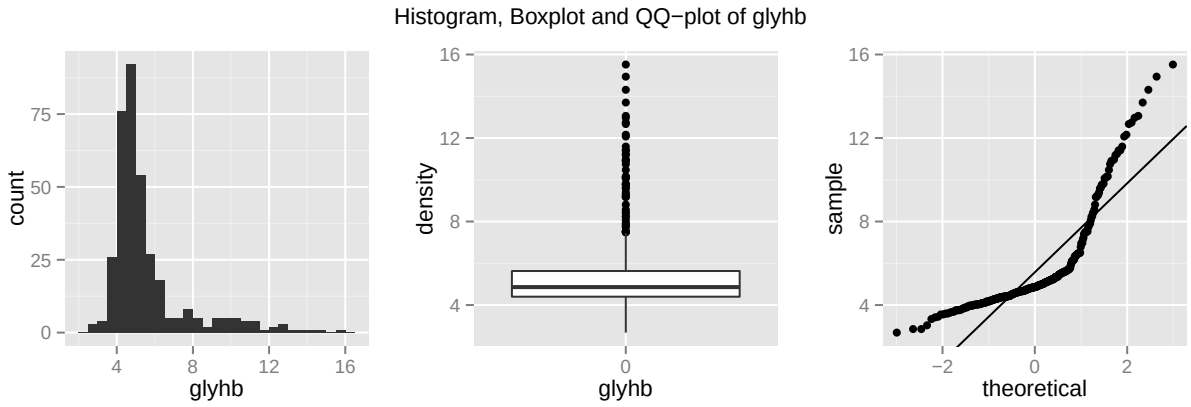
April 27, 2015

1 Background

```
library("ggplot2")
library("grid")
library("gridExtra")

data.df <- na.omit(read.csv("diabetes.csv"))
```

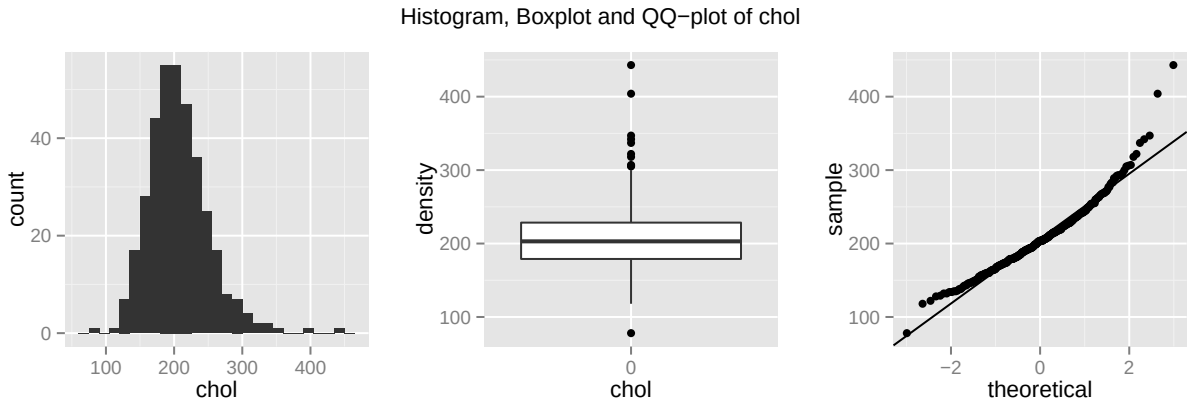
2 Accessing Data, Visualization and Summarization

1.
```
glyhb.histogram <- ggplot(data.df) +
  geom_histogram(aes(x=glyhb), binwidth=0.5)

glyhb.boxplot <- ggplot(data.df) +
  geom_boxplot(aes(x=factor(0), y=glyhb)) +
  labs(x="glyhb", y="density")

glyhb.qqplot <- ggplot(data.df) +
  stat_qq(aes(sample=glyhb)) +
  geom_abline(aes(intercept=mean(glyhb), slope=sd(glyhb)))

grid.arrange(glyhb.histogram, glyhb.boxplot, glyhb.qqplot, ncol=3,
             main="Histogram, Boxplot and QQ-plot of glyhb")
```

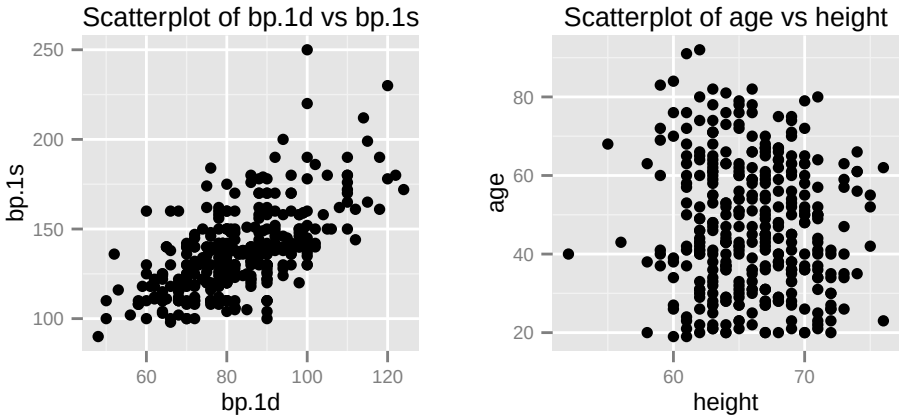


2.
```
chol.histogram <- ggplot(data.df) +
  geom_histogram(aes(x=chol), binwidth=15)

chol.boxplot <- ggplot(data.df) +
```

```
  geom_boxplot(aes(x=factor(0), y=chol)) +
  labs(x="chol", y="density")

chol.qqplot <- ggplot(data.df) +
  stat_qq(aes(sample=chol)) +
  geom_abline(aes(intercept=mean(chol), slope=sd(chol)))

grid.arrange(chol.histogram, chol.boxplot, chol.qqplot, ncol=3,
             main="Histogram, Boxplot and QQ-plot of chol")
```

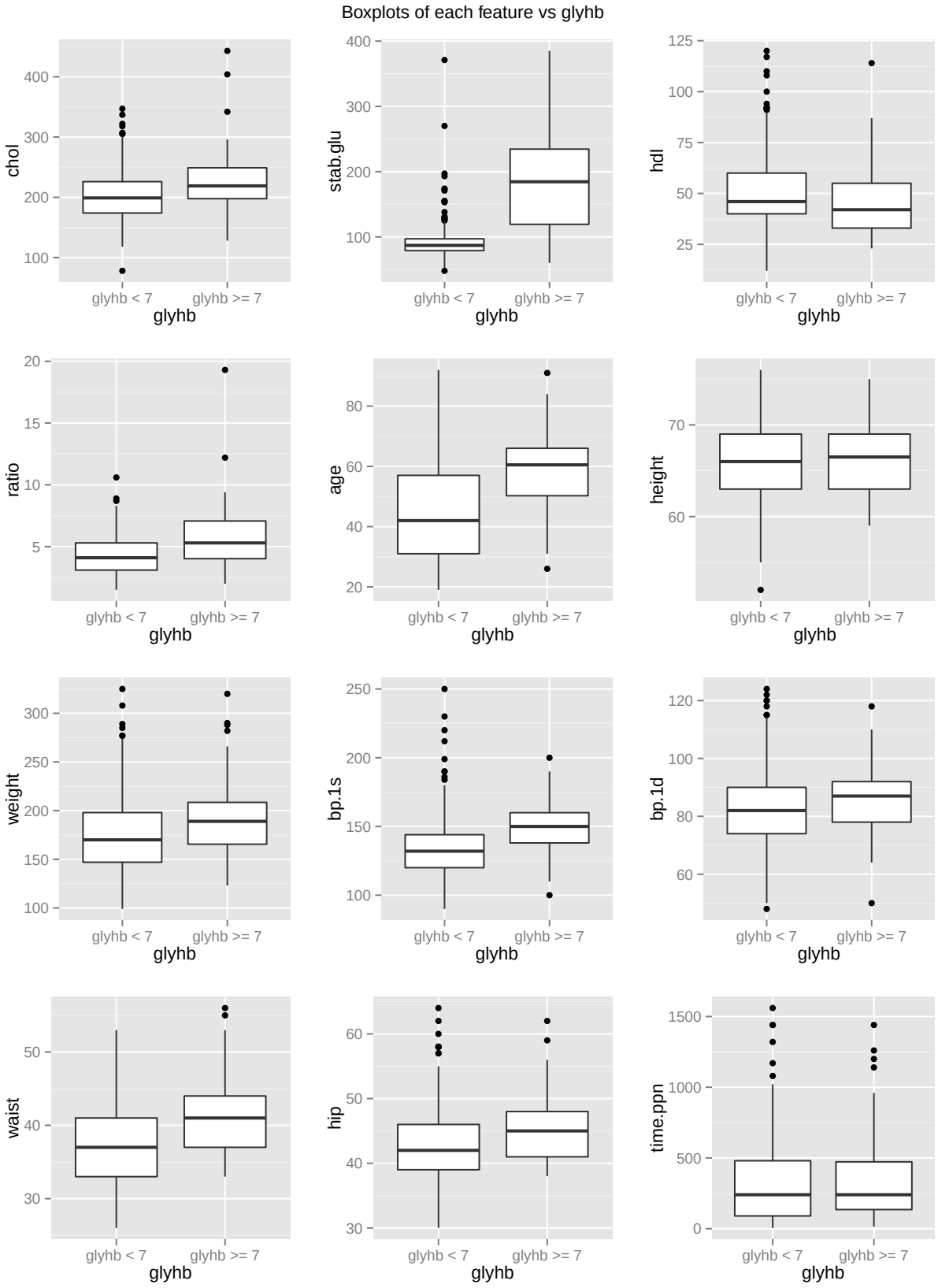


3.
```
bp.1d.bp.1s.scatterplot <- ggplot(data.df) +
  geom_point(aes(x=bp.1d, y=bp.1s)) +
  labs(title="Scatterplot of bp.1d vs bp.1s") +
  theme(text=element_text(size=8.5))

height.age.scatterplot <- ggplot(data.df) +
  geom_point(aes(x=height, y=age)) +
  labs(title="Scatterplot of age vs height") +
  theme(text=element_text(size=8.5))

grid.arrange(bp.1d.bp.1s.scatterplot, height.age.scatterplot, ncol=2)
```



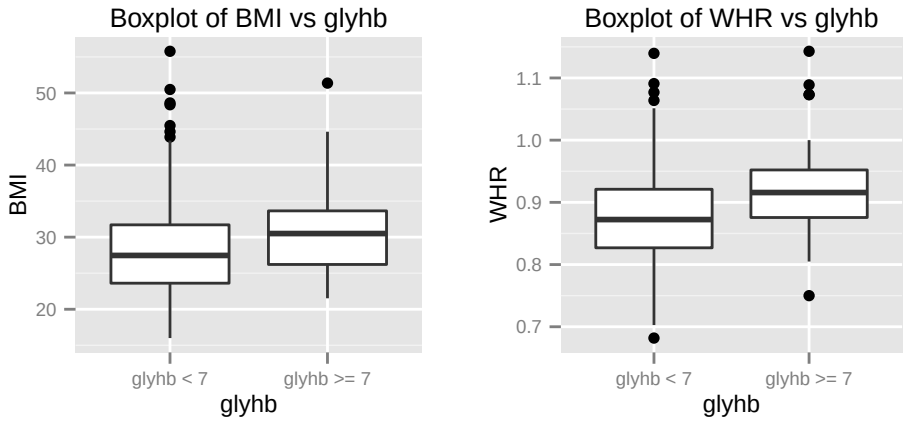
4.
```
data.df$glyhb.cond <- NA
data.df[data.df$glyhb>=7, ]$glyhb.cond <- "glyhb >= 7"
data.df[data.df$glyhb<7, ]$glyhb.cond <- "glyhb < 7"
```

```r
features <- c("chol", "stab.glu", "hdl", "ratio", "age", "height", "weight",
              "bp.1s", "bp.1d", "waist", "hip", "time.ppn")
feature.boxplots = list()
for (i in 1:length(features)) {
  feature <- features[i]
  feature.boxplot <- ggplot(data.frame(glyhb.cond=data.df$glyhb.cond,
                                       feature=data.df[, feature])) +
    geom_boxplot(aes(x=glyhb.cond, y=feature)) +
    labs(x="glyhb", y=feature)
  feature.boxplots[[i]] <- feature.boxplot
}

do.call(grid.arrange, c(feature.boxplots, ncol=3,
                        main="Boxplots of each feature vs glyhb"))
```



5.
```
data.df$BMI <- 703*data.df$weight/data.df$height^2
data.df$WHR <- data.df$waist/data.df$hip

features <- c("BMI", "WHR")
feature.boxplots = list()
for (i in 1:length(features)) {
  feature <- features[i]
```

```
  feature.boxplot <- ggplot(data.frame(glyhb.cond=data.df$glyhb.cond,
                                       feature=data.df[, feature])) +
    geom_boxplot(aes(x=glyhb.cond, y=feature)) +
    labs(title=paste(c("Boxplot of", feature, "vs glyhb"), collapse=" "),
         x="glyhb", y=feature) +
    theme(text=element_text(size=8.5))
  feature.boxplots[[i]] <- feature.boxplot
}

do.call(grid.arrange, c(feature.boxplots, ncol=2))
```



6.

3 Parametric Inferece

1.
2.
3.

4 Testing

1.
2.
3.
4.
5.
6.

5 Regression

1.
2.
3.

4.

5.

6.

7.