

**Instructions:** Answer each question as thoroughly as possible. Round answers to 4 decimal places as needed. Exact answers are best when possible. Be sure to answer all parts of each question.

1. For this problem, you'll need to install the {xts} package. Follow the steps to convert the time series LakeHuron (a built-in dataset in R) to a dataframe. Then perform the indicated analysis.

```
data1 <- as.data.frame(uspop)
data1$times <- rownames(data1)
data1$times<-as.numeric(data1$times)
data1$times<-(data1$times) +1874
data1
```

- a. Plot the data in ggplot. Paste the graph below. Describe the trend.
- b. Use geom\_smooth() to plot a LOESS model to the data. Paste the graph below.
- c. Find the mean. Create a new column of levels measured from the mean. And replot with a linear model.
- d. Write the equation of the resulting model. Is the slope significant? Does the linear model agree with the trend from decompose()?
- e. Compare the results. Which model appears to match the data most closely? Why? Which model do you prefer and under what circumstances?