Note that on both the **Numerical Summaries** and **Graphical Summaries** pages of your Statistics Notebook there are tabs for **R Instructions**. Use these tabs to complete these questions.

Type the following commands into your R Console and press Return (or Enter) after each command.

> ?airquality
> View(airquality)

A help file describing the **airquality** dataset as well as the actual dataset should appear. Answer the following questions to check if you understand how to use the help file and "View" of the dataset.

In which U.S. city was the airquality data recorded?

New York

Which variables are included in the **airquality** dataset? (Mark all that apply.)

- [ ] Radiation
- [x] Ozone
- [x] Solar.R
- [ ] Atmosphere
- [x] Wind
- [ ] Rain
- [x] Temp
- [x] Month
- [x] Day
- [ ] Hour

Which of the following statements is true about the "Wind" variable?

- (•) It is the average wind speed in miles per hour at 0700 and 1000 hours at LaGuardia Airport.
- ( ) It is the hourly recording of wind speed in miles per hour at the LaGuardia Airport between 0700 and 1000 hours.
- ( ) It is the daily recording of wind speed in miles per hour at 0700 hours at LaGuardia Airport.

Use the following questions to see if you can use R to compute the mean, standard deviation, median, minimum, and maximum of a quantitative variable.

What is the mean and standard deviation of the "Wind" speed variable in the **airquality** dataset? (Be sure to look at the R Instructions for **mean** and **standard deviation** on the **Numerical Summaries** page of your Math 325 Notebok for help on how to compute these values.)

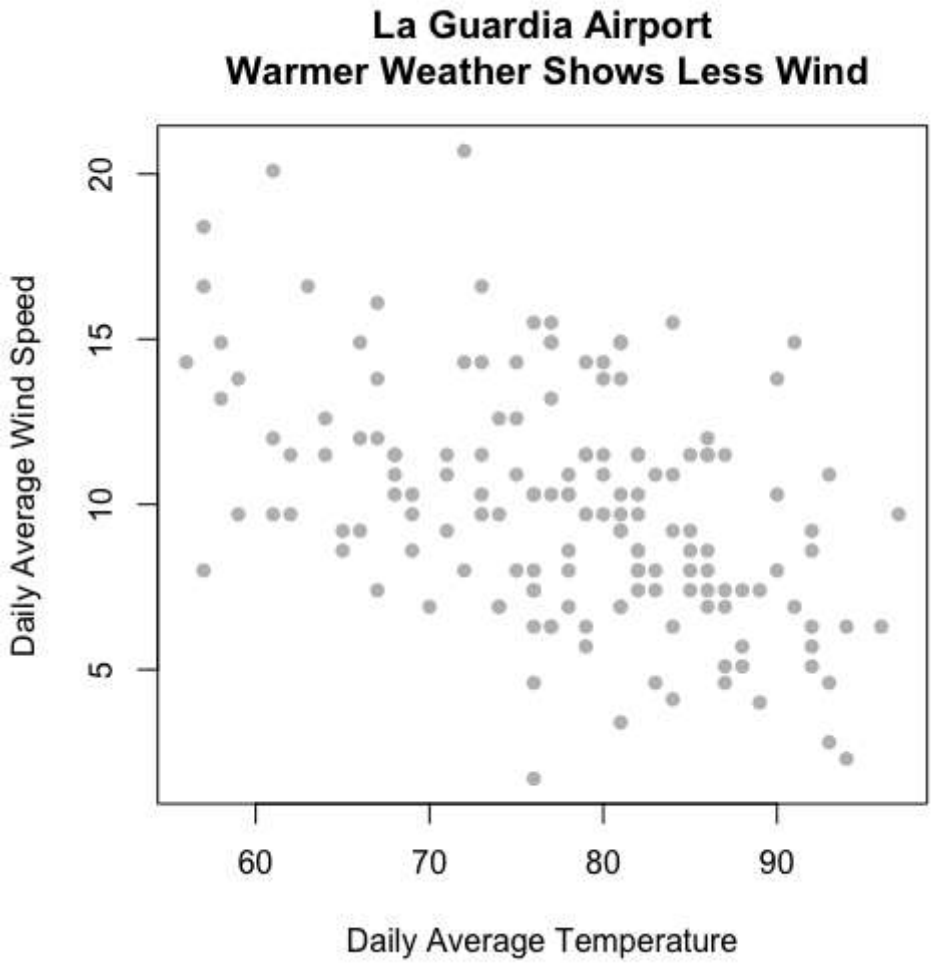
The mean daily average wind speed is 9.957516 mph and the standard deviation is 3.523001 mph.

Note that the median value of wind speed is 9.7 , which is very similar in value to the mean. This shows that the data is symmetric. If the data were right skewed, then the mean would be larger than the median. If the data were left skewed, the mean would be less than the median.

Surprisingly, the lowest (minimum) daily average wind speed recorded was 1.7 mph and the highest (maximum) daily average wind speed recorded was 20.7 mph. Does this imply that the actual wind speed at every moment of each day never went above or below these values during the data collection period?

- ○ Yes. These values represent the maximum and minimum values in the dataset, so nothing could have been higher or lower than these values during the data collection period.
- ◉ No. Even though these values represent the maximum and minimum observed values of the daily "average wind speed in miles per hour at 0700 and 1000 hours at LaGuardia Airport" they do not represent the actual wind speeds that occurred. Thus, it could have been possible that the actual wind speeds went outside these values. For example, there could have been a 30 mph gust of wind on a relatively not windy day so that the average wind speed for that day came out to be rather low.

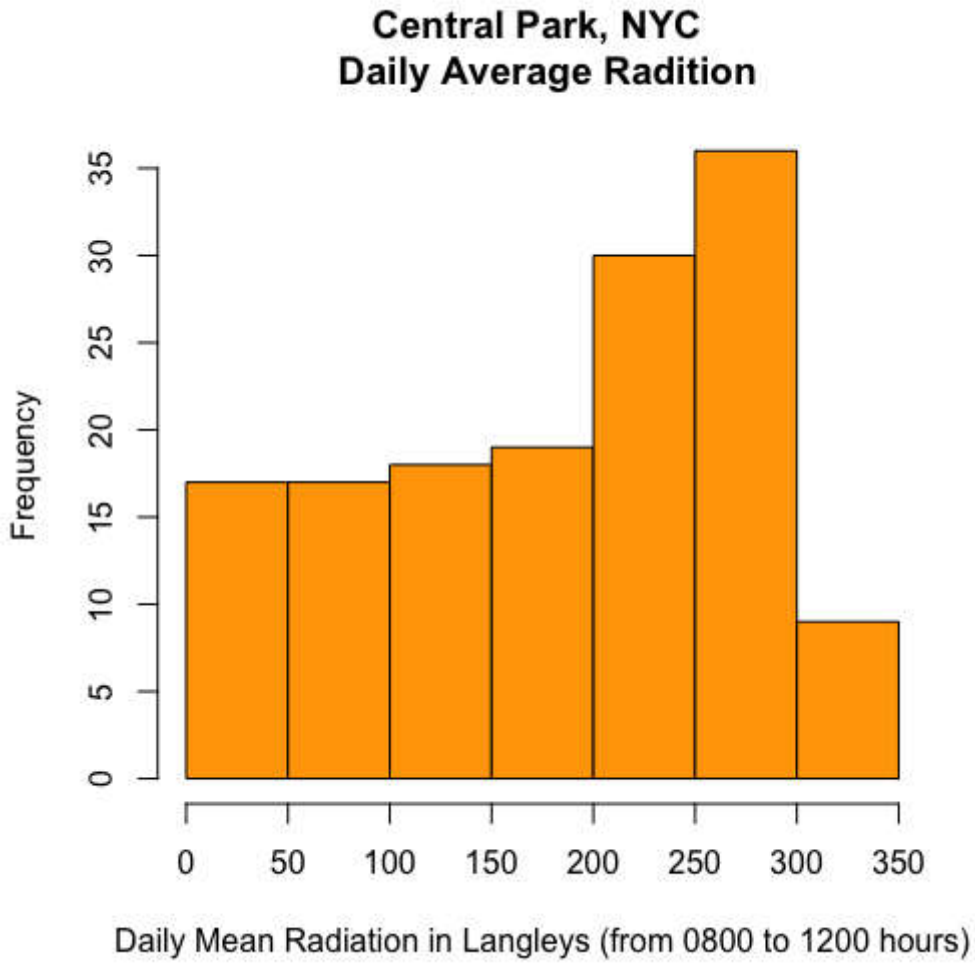
Using the airquality dataset, see if you can reproduce the graphics shown below.



Hint: color is "gray"

- (●) I was able to reproduce this scatterplot.
- ( ) I can get the basic plot, but I can't get either the color or labels or plotting characters to be exactly as shown.
- ( ) I have not been able to reproduce this graphic. I have emailed my teacher for help.

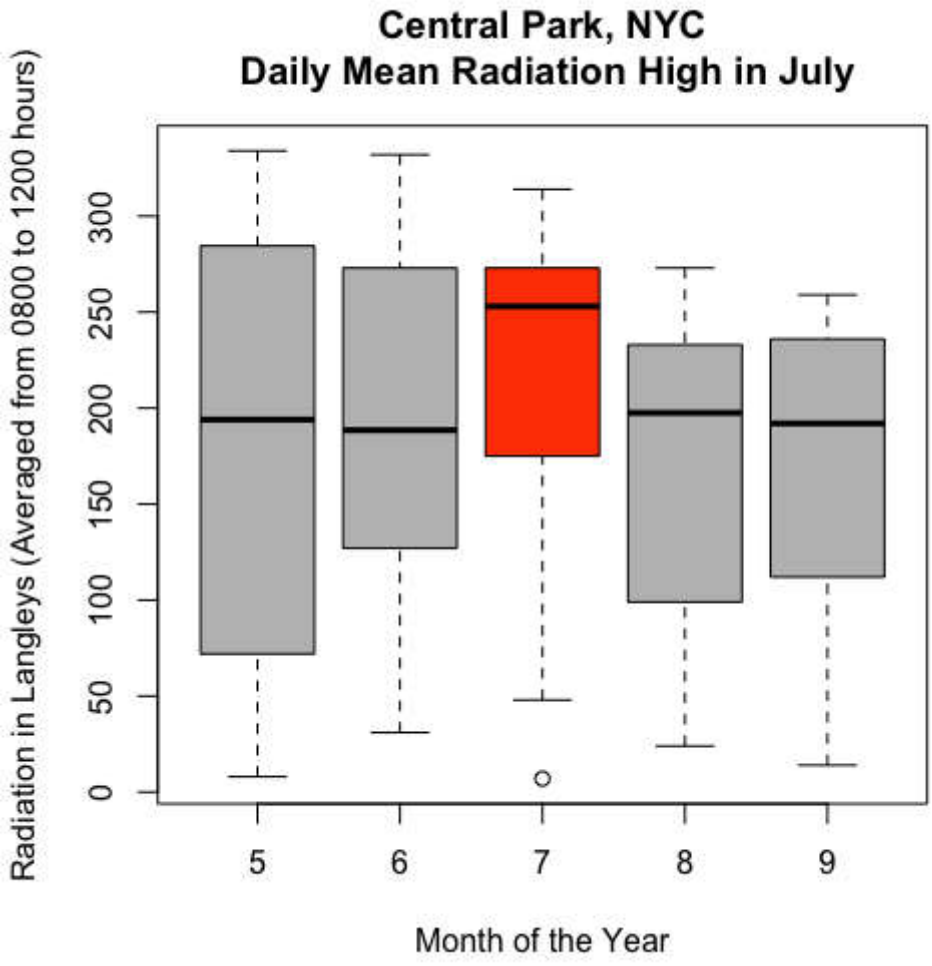
Note that the next graphic uses the Solar.R column of the airquality dataset.



Hint: color is "orange".

- (●) I was able to reproduce this histogram.
- ( ) I can get the basic plot, but I can't get either the color or labels to be exactly as shown.
- ( ) I have not been able to reproduce this graphic. I have emailed my teacher for help.

The following graphic uses both the Solar.R and Month columns of the airquality dataset.



Hint: col=c("gray","gray","orangered","gray","gray")

- (●) I was able to reproduce this side-by-side boxplot.
- ( ) I can get the basic plot, but I can't get either the color or labels to be exactly as shown.
- ( ) I have not been able to reproduce this graphic. I have emailed my teacher for help.