It is often of interest to obtain the mean (or another statistic) of data for several groups. The following questions will help you practice doing this in R.

Your R Code / Numerical Summaries page of your Math 325 Notebook should help you answer the questions on this page.

In your R Console, type the commands:

> ?airquality
> View(airquality)
> library(mosaic)

Then, run an appropriate command to obtain the mean daily temperature at LaGuardia Airport for each month, separately. What was the average (mean) temperature for each month?

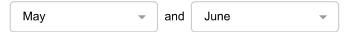| Month Number	Month Name	Mean Temperature
5	May	65.55
6	June	79.1
7	July	83.9
8	August	83.97
9	September	76.9

Which month experiences the coolest average temperature?

| May ▾ |

By how many degrees do the average temperatures of July and August differ?

| .07 |

Between which two *consecutive* months is there the largest difference in average temperature?

| May ▾ | and | June ▾ |

Which of the following graphics would be useful in depicting the above information? (Mark all that apply.)

Hint: Run the codes in R to see what they look like.

- ☐ hist(airquality$Temp, xlab="Daily Temperature", main="LaGuardia Airport (May to September 1973)", col="slategray")

- ☑ plot(Temp ~ Month, data=airquality, xlab="Month", ylab="Temperature", main="LaGuardia Airport (May to September 1973)", pch=16, col="slategray")

- ☑ boxplot(Temp ~ Month, data=airquality, xlab="Month", ylab="Temperature", main="LaGuardia Airport (May to September 1973)", pch=16, col="slategray")

- ☑ stripchart(Temp ~ Month, data=airquality, ylab="Month", xlab="Temperature", main="LaGuardia Airport (May to September 1973)", pch=16, col="slategray", method="stack")

- ☐ plot(Temp ~ Day, data=airquality, xlab="Day of the Month", ylab="Temperature", main="LaGuardia Airport (May to September 1973)", pch=16, col="slategray")

In your R Console, type the commands:

> ?Orange
> View(Orange)

What is the median circumference of the five trees in this data set at ages 484, 1,004, and 1,372 days?

Age (days)	Trunk Circumference (mm)
118	30
484	58
664	87
1,004	125
1,231	142
1,372	174
1,582	177

Select all of the following graphics that would be useful for displaying the above data.

Hint: Run the codes in R to see the graph they produce.

````{r}
plot(circumference ~ age, data=Orange, ylab="Trunk Circumference (mm)", xlab="Age of Trees (days)", main="Trunk
Circumference of Orange Trees", col="ivory3", pch=15)
````

☑ Orange.m <- median(circumference ~ age, data=Orange)
lines(names(Orange.m), Orange.m, col="ivory3")
legend("topleft", legend="Median Growth", lty=1, col='ivory3', bty='n')
````

````{r}
☑ boxplot(circumference ~ age, data=Orange, ylab="Trunk Circumference (mm)", xlab="Age of Trees (days)", main="Trunk
Circumference of Orange Trees", col="ivory3")
````

````{r}
☑ stripchart(circumference ~ age, data=Orange, ylab="Trunk Circumference (mm)", xlab="Age of Trees (days)", main="Trunk
Circumference of Orange Trees", col="ivory3", pch=15, method="stack", vertical=TRUE)
````

````{r}
☐ boxplot(Orange, xlab="Age of Tree (days)", main="Trunk Circumference of Orange Trees", col="ivory3")
````

During which age interval did the most rapid overall median growth occur (in the circumference of the orange trees that were
sampled)?

○ 118 to 484 days (first interval)

○ 484 to 664 days (second interval)

◉ 664 to 1,004 days (third interval)

○ 1,004 to 1,231 days (fourth interval)

○ 1,231 to 1,372 days (fifth interval)

○ 1,372 to 1,582 days (sixth interval)