Practicum III / Mine a Database

Code

Saisrihitha Yadlapalli

In an R Notebook:

1.Inspect the Plant Catalog XML

Hide

```
if("XML" %in% rownames(installed.packages()) == FALSE) {
  install.packages("XML")
}
library(XML)
xmlPlant <- xmlParse("plants.xml")
xmlPlant
```

```
<?xml version="1.0"?>
<CATALOG>
  <PLANT>
    <COMMON>Bloodroot</COMMON>
    <BOTANICAL>Sanguinaria canadensis</BOTANICAL>
    <ZONE>4</ZONE>
    <LIGHT>Mostly Shady</LIGHT>
    <PRICE>$2.44</PRICE>
    <AVAILABILITY>031599</AVAILABILITY>
  </PLANT>
  <PLANT>
    <COMMON>Columbine</COMMON>
    <BOTANICAL>Aquilegia canadensis</BOTANICAL>
    <ZONE>3</ZONE>
    <LIGHT>Mostly Shady</LIGHT>
    <PRICE>$9.37</PRICE>
    <AVAILABILITY>030699</AVAILABILITY>
  </PLANT>
  <PLANT>
    <COMMON>Marsh Marigold</COMMON>
    <BOTANICAL>Caltha palustris</BOTANICAL>
    <ZONE>4</ZONE>
    <LIGHT>Mostly Sunny</LIGHT>
    <PRICE>$6.81</PRICE>
    <AVAILABILITY>051799</AVAILABILITY>
  </PLANT>
  <PLANT>
    <COMMON>Cowslip</COMMON>
    <BOTANICAL>Caltha palustris</BOTANICAL>
    <ZONE>4</ZONE>
    <LIGHT>Mostly Shady</LIGHT>
    <PRICE>$9.90</PRICE>
    <AVAILABILITY>030699</AVAILABILITY>
  </PLANT>
  <PLANT>
    <COMMON>Dutchman's-Breeches</COMMON>
    <BOTANICAL>Dicentra cucullaria</BOTANICAL>
    <ZONE>3</ZONE>
    <LIGHT>Mostly Shady</LIGHT>
    <PRICE>$6.44</PRICE>
    <AVAILABILITY>012099</AVAILABILITY>
  </PLANT>
  <PLANT>
    <COMMON>Ginger, Wild</COMMON>
    <BOTANICAL>Asarum canadense</BOTANICAL>
    <ZONE>3</ZONE>
    <LIGHT>Mostly Shady</LIGHT>
    <PRICE>$9.03</PRICE>
    <AVAILABILITY>041899</AVAILABILITY>
  </PLANT>
  <PLANT>
    <COMMON>Hepatica</COMMON>
    <BOTANICAL>Hepatica americana</BOTANICAL>
    <ZONE>4</ZONE>
    <LIGHT>Mostly Shady</LIGHT>
    <PRICE>$4.45</PRICE>
    <AVAILABILITY>012699</AVAILABILITY>
```

```
</PLANT>
<PLANT>
  <COMMON>Liverleaf</COMMON>
  <BOTANICAL>Hepatica americana</BOTANICAL>
  <ZONE>4</ZONE>
  <LIGHT>Mostly Shady</LIGHT>
  <PRICE>$3.99</PRICE>
  <AVAILABILITY>010299</AVAILABILITY>
</PLANT>
<PLANT>
  <COMMON>Jack-In-The-Pulpit</COMMON>
  <BOTANICAL>Arisaema triphyllum</BOTANICAL>
  <ZONE>4</ZONE>
  <LIGHT>Mostly Shady</LIGHT>
  <PRICE>$3.23</PRICE>
  <AVAILABILITY>020199</AVAILABILITY>
</PLANT>
<PLANT>
  <COMMON>Mayapple</COMMON>
  <BOTANICAL>Podophyllum peltatum</BOTANICAL>
  <ZONE>3</ZONE>
  <LIGHT>Mostly Shady</LIGHT>
  <PRICE>$2.98</PRICE>
  <AVAILABILITY>060599</AVAILABILITY>
</PLANT>
<PLANT>
  <COMMON>Phlox, Woodland</COMMON>
  <BOTANICAL>Phlox divaricata</BOTANICAL>
  <ZONE>3</ZONE>
  <LIGHT>Sun or Shade</LIGHT>
  <PRICE>$2.80</PRICE>
  <AVAILABILITY>012299</AVAILABILITY>
</PLANT>
<PLANT>
  <COMMON>Phlox, Blue</COMMON>
  <BOTANICAL>Phlox divaricata</BOTANICAL>
  <ZONE>3</ZONE>
  <LIGHT>Sun or Shade</LIGHT>
  <PRICE>$5.59</PRICE>
  <AVAILABILITY>021699</AVAILABILITY>
</PLANT>
<PLANT>
  <COMMON>Spring-Beauty</COMMON>
  <BOTANICAL>Claytonia Virginica</BOTANICAL>
  <ZONE>7</ZONE>
  <LIGHT>Mostly Shady</LIGHT>
  <PRICE>$6.59</PRICE>
  <AVAILABILITY>020199</AVAILABILITY>
</PLANT>
<PLANT>
  <COMMON>Trillium</COMMON>
  <BOTANICAL>Trillium grandiflorum</BOTANICAL>
  <ZONE>5</ZONE>
  <LIGHT>Sun or Shade</LIGHT>
  <PRICE>$3.90</PRICE>
  <AVAILABILITY>042999</AVAILABILITY>
</PLANT>
<PLANT>
```

```
  <COMMON>Wake Robin</COMMON>
  <BOTANICAL>Trillium grandiflorum</BOTANICAL>
  <ZONE>5</ZONE>
  <LIGHT>Sun or Shade</LIGHT>
  <PRICE>$3.20</PRICE>
  <AVAILABILITY>022199</AVAILABILITY>
</PLANT>
<PLANT>
  <COMMON>Violet, Dog-Tooth</COMMON>
  <BOTANICAL>Erythronium americanum</BOTANICAL>
  <ZONE>4</ZONE>
  <LIGHT>Shade</LIGHT>
  <PRICE>$9.04</PRICE>
  <AVAILABILITY>020199</AVAILABILITY>
</PLANT>
<PLANT>
  <COMMON>Trout Lily</COMMON>
  <BOTANICAL>Erythronium americanum</BOTANICAL>
  <ZONE>4</ZONE>
  <LIGHT>Shade</LIGHT>
  <PRICE>$6.94</PRICE>
  <AVAILABILITY>032499</AVAILABILITY>
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<PLANT>
  <COMMON>Adder's-Tongue</COMMON>
  <BOTANICAL>Erythronium americanum</BOTANICAL>
  <ZONE>4</ZONE>
  <LIGHT>Shade</LIGHT>
  <PRICE>$9.58</PRICE>
  <AVAILABILITY>041399</AVAILABILITY>
</PLANT>
<PLANT>
  <COMMON>Anemone</COMMON>
  <BOTANICAL>Anemone blanda</BOTANICAL>
  <ZONE>6</ZONE>
  <LIGHT>Mostly Shady</LIGHT>
  <PRICE>$8.86</PRICE>
  <AVAILABILITY>122698</AVAILABILITY>
</PLANT>
<PLANT>
  <COMMON>Grecian Windflower</COMMON>
  <BOTANICAL>Anemone blanda</BOTANICAL>
  <ZONE>6</ZONE>
  <LIGHT>Mostly Shady</LIGHT>
  <PRICE>$9.16</PRICE>
  <AVAILABILITY>071099</AVAILABILITY>
</PLANT>
<PLANT>
  <COMMON>Bee Balm</COMMON>
  <BOTANICAL>Monarda didyma</BOTANICAL>
  <ZONE>4</ZONE>
  <LIGHT>Shade</LIGHT>
  <PRICE>$4.59</PRICE>
  <AVAILABILITY>050399</AVAILABILITY>
</PLANT>
<PLANT>
  <COMMON>Bergamot</COMMON>
  <BOTANICAL>Monarda didyma</BOTANICAL>
```

```
  <ZONE>4</ZONE>
  <LIGHT>Shade</LIGHT>
  <PRICE>$7.16</PRICE>
  <AVAILABILITY>042799</AVAILABILITY>
</PLANT>
<PLANT>
  <COMMON>Black-Eyed Susan</COMMON>
  <BOTANICAL>Rudbeckia hirta</BOTANICAL>
  <ZONE>Annual</ZONE>
  <LIGHT>Sunny</LIGHT>
  <PRICE>$9.80</PRICE>
  <AVAILABILITY>061899</AVAILABILITY>
</PLANT>
<PLANT>
  <COMMON>Buttercup</COMMON>
  <BOTANICAL>Ranunculus</BOTANICAL>
  <ZONE>4</ZONE>
  <LIGHT>Shade</LIGHT>
  <PRICE>$2.57</PRICE>
  <AVAILABILITY>061099</AVAILABILITY>
</PLANT>
<PLANT>
  <COMMON>Crowfoot</COMMON>
  <BOTANICAL>Ranunculus</BOTANICAL>
  <ZONE>4</ZONE>
  <LIGHT>Shade</LIGHT>
  <PRICE>$9.34</PRICE>
  <AVAILABILITY>040399</AVAILABILITY>
</PLANT>
<PLANT>
  <COMMON>Butterfly Weed</COMMON>
  <BOTANICAL>Asclepias tuberosa</BOTANICAL>
  <ZONE>Annual</ZONE>
  <LIGHT>Sunny</LIGHT>
  <PRICE>$2.78</PRICE>
  <AVAILABILITY>063099</AVAILABILITY>
</PLANT>
<PLANT>
  <COMMON>Cinquefoil</COMMON>
  <BOTANICAL>Potentilla</BOTANICAL>
  <ZONE>Annual</ZONE>
  <LIGHT>Shade</LIGHT>
  <PRICE>$7.06</PRICE>
  <AVAILABILITY>052599</AVAILABILITY>
</PLANT>
<PLANT>
  <COMMON>Primrose</COMMON>
  <BOTANICAL>Oenothera</BOTANICAL>
  <ZONE>3 - 5</ZONE>
  <LIGHT>Sunny</LIGHT>
  <PRICE>$6.56</PRICE>
  <AVAILABILITY>013099</AVAILABILITY>
</PLANT>
<PLANT>
  <COMMON>Gentian</COMMON>
  <BOTANICAL>Gentiana</BOTANICAL>
  <ZONE>4</ZONE>
  <LIGHT>Sun or Shade</LIGHT>
```

```
    <PRICE>$7.81</PRICE>
    <AVAILABILITY>051899</AVAILABILITY>
  </PLANT>
  <PLANT>
    <COMMON>Blue Gentian</COMMON>
    <BOTANICAL>Gentiana</BOTANICAL>
    <ZONE>4</ZONE>
    <LIGHT>Sun or Shade</LIGHT>
    <PRICE>$8.56</PRICE>
    <AVAILABILITY>050299</AVAILABILITY>
  </PLANT>
  <PLANT>
    <COMMON>Jacob's Ladder</COMMON>
    <BOTANICAL>Polemonium caeruleum</BOTANICAL>
    <ZONE>Annual</ZONE>
    <LIGHT>Shade</LIGHT>
    <PRICE>$9.26</PRICE>
    <AVAILABILITY>022199</AVAILABILITY>
  </PLANT>
  <PLANT>
    <COMMON>Greek Valerian</COMMON>
    <BOTANICAL>Polemonium caeruleum</BOTANICAL>
    <ZONE>Annual</ZONE>
    <LIGHT>Shade</LIGHT>
    <PRICE>$4.36</PRICE>
    <AVAILABILITY>071499</AVAILABILITY>
  </PLANT>
  <PLANT>
    <COMMON>California Poppy</COMMON>
    <BOTANICAL>Eschscholzia californica</BOTANICAL>
    <ZONE>Annual</ZONE>
    <LIGHT>Sun</LIGHT>
    <PRICE>$7.89</PRICE>
    <AVAILABILITY>032799</AVAILABILITY>
  </PLANT>
  <PLANT>
    <COMMON>Shooting Star</COMMON>
    <BOTANICAL>Dodecatheon</BOTANICAL>
    <ZONE>Annual</ZONE>
    <LIGHT>Mostly Shady</LIGHT>
    <PRICE>$8.60</PRICE>
    <AVAILABILITY>051399</AVAILABILITY>
  </PLANT>
  <PLANT>
    <COMMON>Snakeroot</COMMON>
    <BOTANICAL>Cimicifuga</BOTANICAL>
    <ZONE>Annual</ZONE>
    <LIGHT>Shade</LIGHT>
    <PRICE>$5.63</PRICE>
    <AVAILABILITY>071199</AVAILABILITY>
  </PLANT>
  <PLANT>
    <COMMON>Cardinal Flower</COMMON>
    <BOTANICAL>Lobelia cardinalis</BOTANICAL>
    <ZONE>2</ZONE>
    <LIGHT>Shade</LIGHT>
    <PRICE>$3.02</PRICE>
    <AVAILABILITY>022299</AVAILABILITY>
```

```
  </PLANT>
</CATALOG>
```

2.Load the Plant Catalog XML directly into a dataframe using xmlToDataFrame.

Hide

```
library(XML)
plants = xmlToDataFrame("plants.xml")
plants
```

COMMON <chr>	BOTANICAL <chr>	ZONE <chr>	LIGHT <chr>	PR... <chr>	AVAILABILIT <chr>
Bloodroot	Sanguinaria canadensis	4	Mostly Shady	$2.44	031599
Columbine	Aquilegia canadensis	3	Mostly Shady	$9.37	030699
Marsh Marigold	Caltha palustris	4	Mostly Sunny	$6.81	051799
Cowslip	Caltha palustris	4	Mostly Shady	$9.90	030699
Dutchman's-Breeches	Dicentra cucullaria	3	Mostly Shady	$6.44	012099
Ginger, Wild	Asarum canadense	3	Mostly Shady	$9.03	041899
Hepatica	Hepatica americana	4	Mostly Shady	$4.45	012699
Liverleaf	Hepatica americana	4	Mostly Shady	$3.99	010299
Jack-In-The-Pulpit	Arisaema triphyllum	4	Mostly Shady	$3.23	020199
Mayapple	Podophyllum peltatum	3	Mostly Shady	$2.98	060599

1-10 of 36 rows Previous **1** 2 3 4 Next

3.Create a new column retail that is a numeric column and has the data from the price column; note that the price column is text and contains a leading '$' and needs to be parsed properly.

Hide

```
if("stringi" %in% rownames(installed.packages()) == FALSE) {
  install.packages("stringi")
}
library(stringi)
plants$RETAIL = as.numeric(stri_replace_all_fixed(plants$PRICE,"$",""))
plants
```

COMMON <chr>	BOTANICAL <chr>	ZONE <chr>	LIGHT <chr>	PR... <chr>	AVAILABILIT <chr>
Bloodroot	Sanguinaria canadensis	4	Mostly Shady	$2.44	031599
Columbine	Aquilegia canadensis	3	Mostly Shady	$9.37	030699

COMMON <chr>	BOTANICAL <chr>	ZONE <chr>	LIGHT <chr>	PR... <chr>	AVAILABILIT <chr>
Marsh Marigold	Caltha palustris	4	Mostly Sunny	$6.81	051799
Cowslip	Caltha palustris	4	Mostly Shady	$9.90	030699
Dutchman's-Breeches	Dicentra cucullaria	3	Mostly Shady	$6.44	012099
Ginger, Wild	Asarum canadense	3	Mostly Shady	$9.03	041899
Hepatica	Hepatica americana	4	Mostly Shady	$4.45	012699
Liverleaf	Hepatica americana	4	Mostly Shady	$3.99	010299
Jack-In-The-Pulpit	Arisaema triphyllum	4	Mostly Shady	$3.23	020199
Mayapple	Podophyllum peltatum	3	Mostly Shady	$2.98	060599

1-10 of 36 rows Previous **1** 2 3 4 Next

4.Remove the original price column (the one that is text) from the dataframe.

Hide

```
plants$PRICE <- NULL
plants
```

COMMON <chr>	BOTANICAL <chr>	ZONE <chr>	LIGHT <chr>	AVAILABILITY <chr>	RE <c
Bloodroot	Sanguinaria canadensis	4	Mostly Shady	031599	2
Columbine	Aquilegia canadensis	3	Mostly Shady	030699	9
Marsh Marigold	Caltha palustris	4	Mostly Sunny	051799	6
Cowslip	Caltha palustris	4	Mostly Shady	030699	9
Dutchman's-Breeches	Dicentra cucullaria	3	Mostly Shady	012099	6
Ginger, Wild	Asarum canadense	3	Mostly Shady	041899	9
Hepatica	Hepatica americana	4	Mostly Shady	012699	4
Liverleaf	Hepatica americana	4	Mostly Shady	010299	3
Jack-In-The-Pulpit	Arisaema triphyllum	4	Mostly Shady	020199	3
Mayapple	Podophyllum peltatum	3	Mostly Shady	060599	2

1-10 of 36 rows Previous **1** 2 3 4 Next

5.Update all prices: increase them by 4.25%.

Hide

```
plants$RETAIL <- plants$RETAIL + (0.0425 * plants$RETAIL)
plants
```

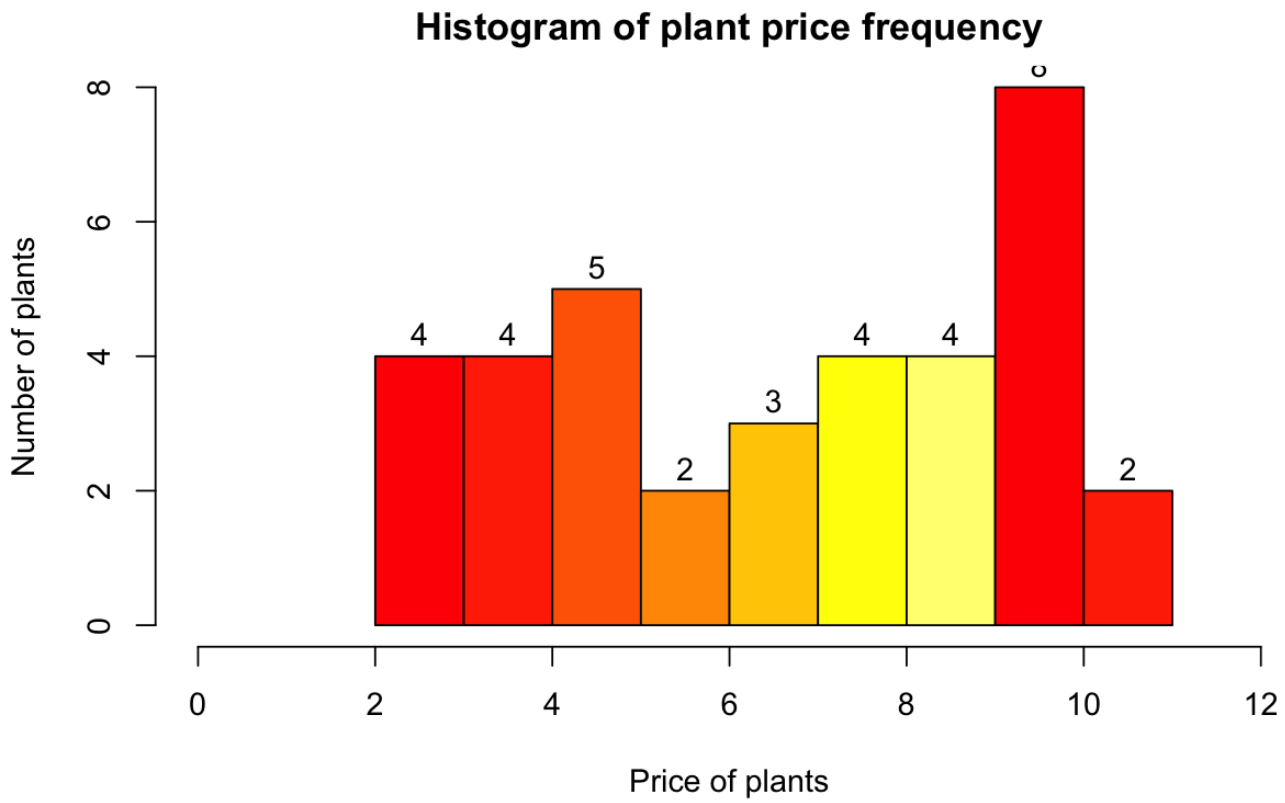
COMMON <chr>	BOTANICAL <chr>	ZONE <chr>	LIGHT <chr>	AVAILABILITY <chr>	
Bloodroot	Sanguinaria canadensis	4	Mostly Shady	031599	2
Columbine	Aquilegia canadensis	3	Mostly Shady	030699	9
Marsh Marigold	Caltha palustris	4	Mostly Sunny	051799	7
Cowslip	Caltha palustris	4	Mostly Shady	030699	10
Dutchman's-Breeches	Dicentra cucullaria	3	Mostly Shady	012099	6
Ginger, Wild	Asarum canadense	3	Mostly Shady	041899	9
Hepatica	Hepatica americana	4	Mostly Shady	012699	4
Liverleaf	Hepatica americana	4	Mostly Shady	010299	4
Jack-In-The-Pulpit	Arisaema triphyllum	4	Mostly Shady	020199	3
Mayapple	Podophyllum peltatum	3	Mostly Shady	060599	3

1-10 of 36 rows Previous **1** 2 3 4 Next

6.Create a histogram of the number of plants by price. Adorn the chart.

Hide

```
price<- plants$RETAIL
heatcols <- heat.colors(7)
hist(price,main="Histogram of plant price frequency",
     xlab="Price of plants",
     ylab="Number of plants",
     xlim=c(0,12),
     col= heatcols,
     labels=TRUE)
```



7.Using sqldf create a SQL query that finds the common names of all plants that cost less than $8 and grow in Sunny light.

Hide

```
if("sqldf" %in% rownames(installed.packages()) == FALSE) {
  install.packages("sqldf")
}
library(sqldf)
```

Hide

```
sqldf("SELECT COMMON FROM plants WHERE RETAIL < 8 AND LIGHT = 'Sunny'")
```

COMMON
<chr>
Butterfly Weed
Primrose

2 rows

8.Using either sqldf or dataframe functions, how many plants grow in full shade?

Hide

```
sqldf("SELECT COUNT(*) AS 'number of plants that grow in full shade' FROM plants WHER
E LIGHT = 'Shade'")
```

number of plants that grow in full shade
<int>
12

1 row

9.Write the dataframe to a new table in a new SQLite database using the dbWriteTable function.

Hide

```
if("DBI" %in% rownames(installed.packages()) == FALSE) {
  install.packages("DBI")
}
library(DBI)
fn <- "plantsSQL.db"
if (file.exists(fn))
  file.remove(fn)
```

```
[1] TRUE
```

Hide

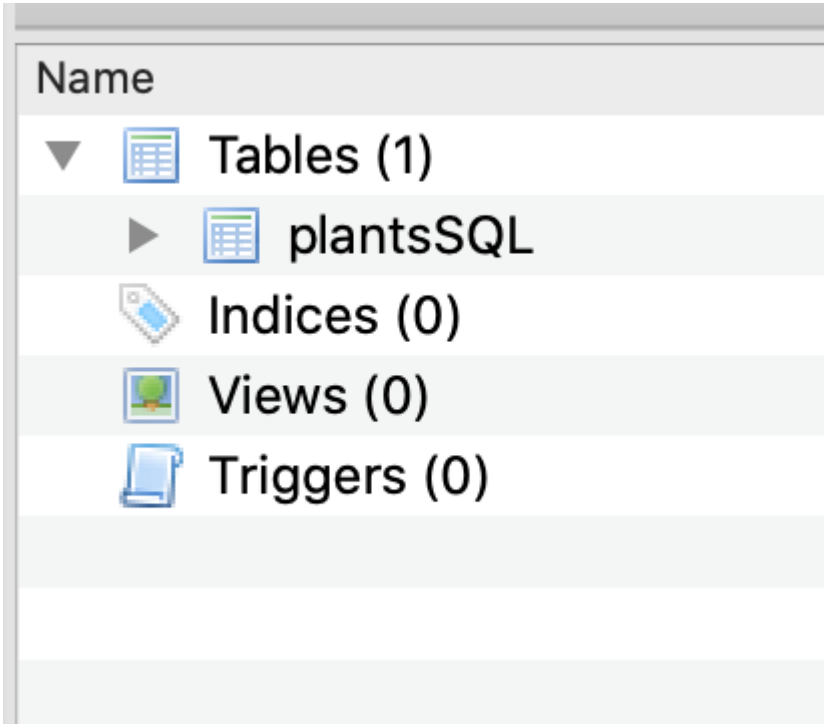
```
con <- dbConnect(RSQLite::SQLite(), "plantsSQL.db")
dbWriteTable(con, "plantsSQL", plants)
```

In SQLite:

1.Inspect the database created in (9) above. Is the table there? What is its name? Are the columns correct?

Yes, as can be seen in the image below the ‘plants’ dataframe that was written into a new table ‘plantsSQL’ in step (9) is present in the SQLite database.

The name of the table is ‘plantsSQL’.



Yes, all the columns as can be seen in the image below, ‘COMMON’, ‘BOTANICAL’, ‘ZONE’, ‘LIGHT’, ‘AVAILABILITY’ and ‘RETAIL’ that are present in the dataframe are present correctly in the table ‘plantsSQL’ as well.

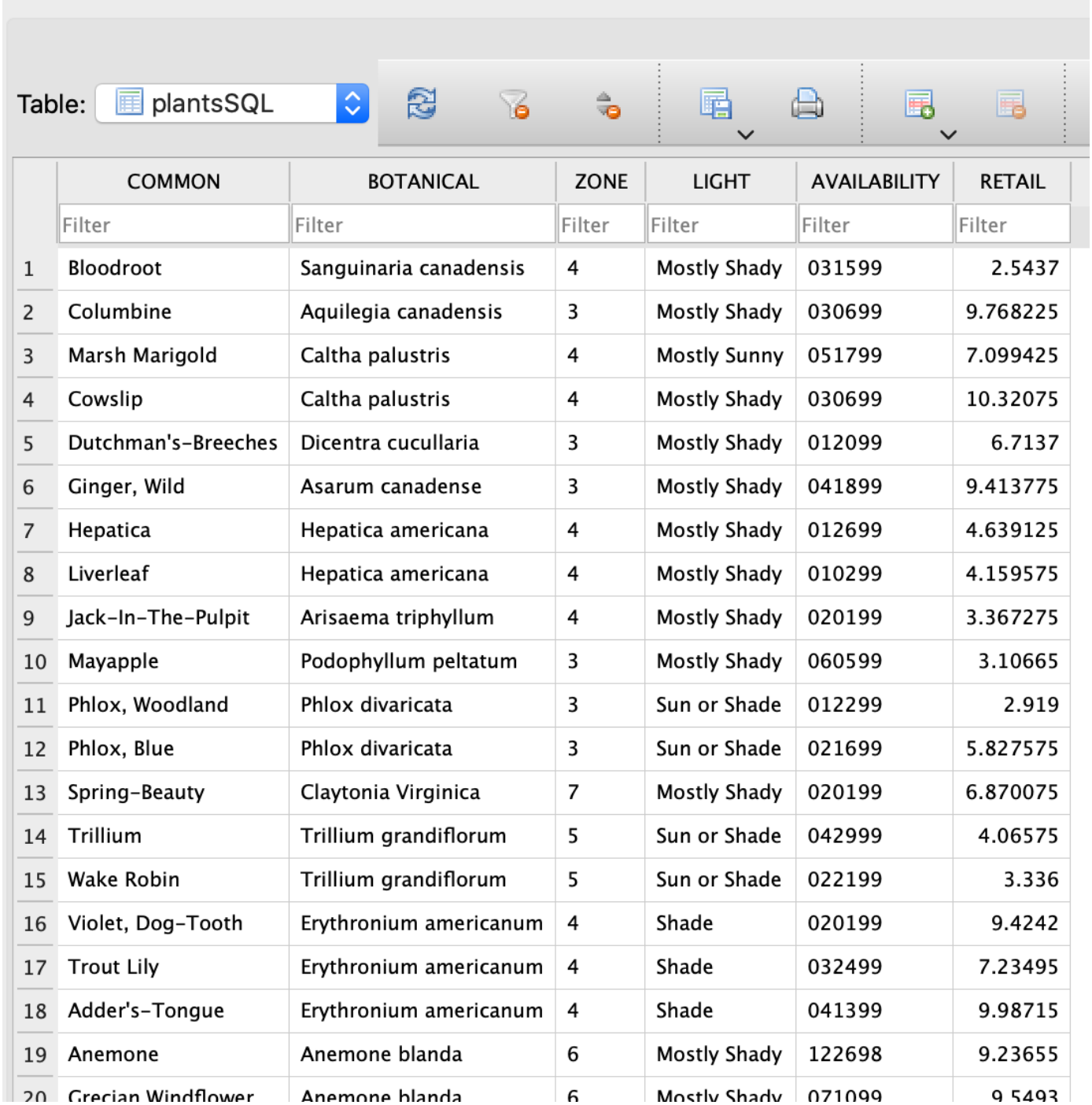


Table: plantsSQL

	COMMON	BOTANICAL	ZONE	LIGHT	AVAILABILITY	RETAIL
	Filter	Filter	Filter	Filter	Filter	Filter
1	Bloodroot	Sanguinaria canadensis	4	Mostly Shady	031599	2.5437
2	Columbine	Aquilegia canadensis	3	Mostly Shady	030699	9.768225
3	Marsh Marigold	Caltha palustris	4	Mostly Sunny	051799	7.099425
4	Cowslip	Caltha palustris	4	Mostly Shady	030699	10.32075
5	Dutchman's-Breeches	Dicentra cucullaria	3	Mostly Shady	012099	6.7137
6	Ginger, Wild	Asarum canadense	3	Mostly Shady	041899	9.413775
7	Hepatica	Hepatica americana	4	Mostly Shady	012699	4.639125
8	Liverleaf	Hepatica americana	4	Mostly Shady	010299	4.159575
9	Jack-In-The-Pulpit	Arisaema triphyllum	4	Mostly Shady	020199	3.367275
10	Mayapple	Podophyllum peltatum	3	Mostly Shady	060599	3.10665
11	Phlox, Woodland	Phlox divaricata	3	Sun or Shade	012299	2.919
12	Phlox, Blue	Phlox divaricata	3	Sun or Shade	021699	5.827575
13	Spring-Beauty	Claytonia Virginica	7	Mostly Shady	020199	6.870075
14	Trillium	Trillium grandiflorum	5	Sun or Shade	042999	4.06575
15	Wake Robin	Trillium grandiflorum	5	Sun or Shade	022199	3.336
16	Violet, Dog-Tooth	Erythronium americanum	4	Shade	020199	9.4242
17	Trout Lily	Erythronium americanum	4	Shade	032499	7.23495
18	Adder's-Tongue	Erythronium americanum	4	Shade	041399	9.98715
19	Anemone	Anemone blanda	6	Mostly Shady	122698	9.23655
20	Grecian Windflower	Anemone blanda	6	Mostly Shady	071099	9.5493

2.Write a SQL UPDATE statement that decreases all prices by 0.75%.

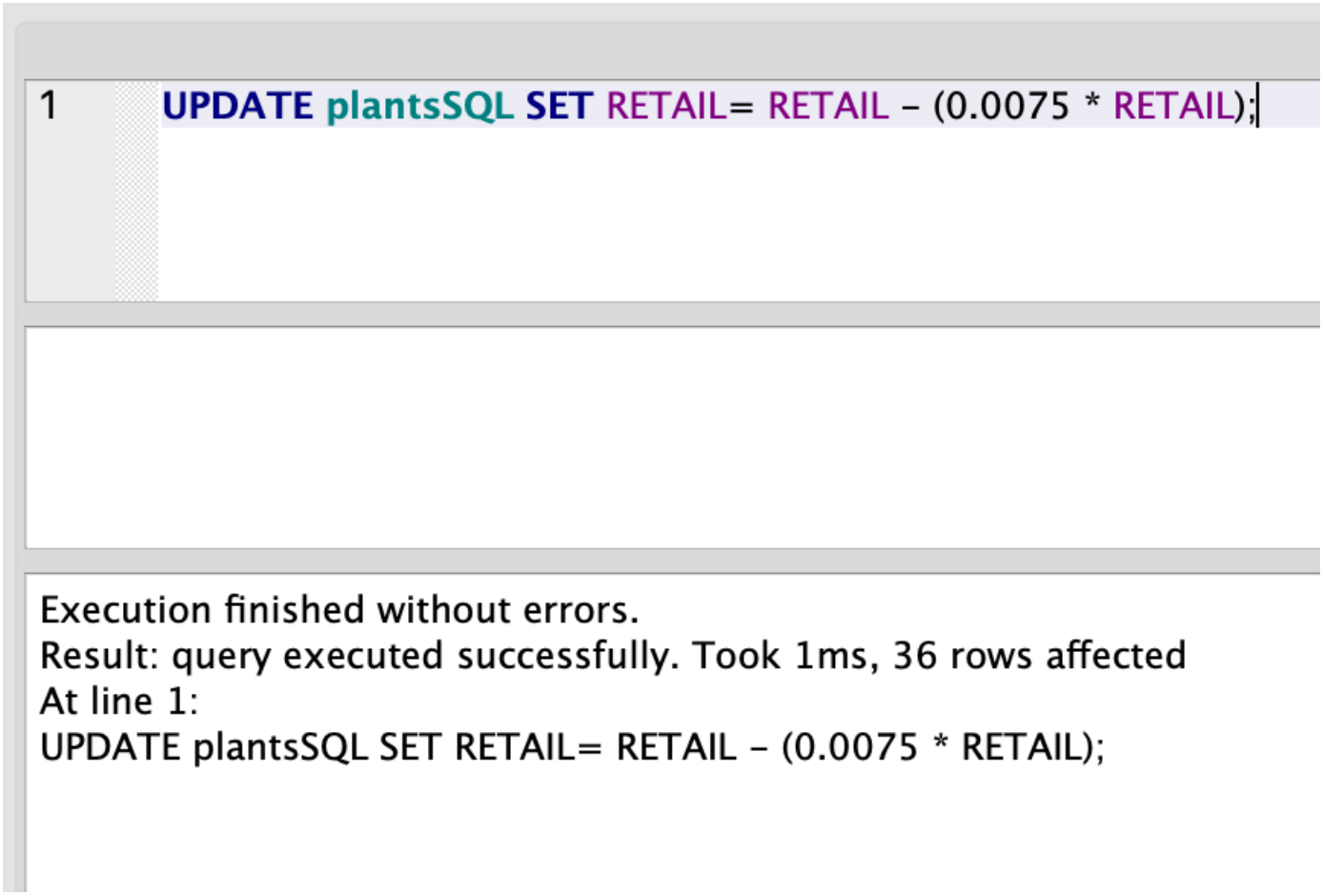


Fig: SQL UPDATE statement that decreases all prices by 0.75% in SQLite

RETAIL
Filter
2.52462225
9.6949633125
7.0461793125
10.243344375
6.66334725
9.3431716875
4.6043315625
4.1283781875
3.3420204375
3.083350125
2.8971075
5.7838681875
6.8185494375
4.035256875
3.31098
9.3535185
7.180687875
9.912246375
9.167275875

Fig: After the update

In R Studio:

1.Connect to the SQLite database from above.

Hide

```
con <- dbConnect(SQLite(), dbname="plantsSQL.db" )
dbReadTable(con, "plantsSQL")
```

COMMON <chr>	BOTANICAL <chr>	ZONE <chr>	LIGHT <chr>	AVAILABILITY <chr>	
Bloodroot	Sanguinaria canadensis	4	Mostly Shady	031599	2
Columbine	Aquilegia canadensis	3	Mostly Shady	030699	9
Marsh Marigold	Caltha palustris	4	Mostly Sunny	051799	7
Cowslip	Caltha palustris	4	Mostly Shady	030699	10
Dutchman's-Breeches	Dicentra cucullaria	3	Mostly Shady	012099	6
Ginger, Wild	Asarum canadense	3	Mostly Shady	041899	9
Hepatica	Hepatica americana	4	Mostly Shady	012699	4
Liverleaf	Hepatica americana	4	Mostly Shady	010299	4
Jack-In-The-Pulpit	Arisaema triphyllum	4	Mostly Shady	020199	3
Mayapple	Podophyllum peltatum	3	Mostly Shady	060599	3

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2.Build and execute a SQL query that finds the number of plants by light.

Hide

```
result <- dbGetQuery(con, "SELECT COUNT(*) AS 'number of plants by light', LIGHT FROM
plantsSQL GROUP BY LIGHT")
result
```

number of plants by light <int>	LIGHT <chr>
13	Mostly Shady
1	Mostly Sunny
12	Shade
1	Sun
6	Sun or Shade
3	Sunny

6 rows

Hide

```
dbDisconnect(con)
```

In R Studio:

1.Parse the Plant Catalog XML and write an XPath query that finds all plants that grow in full shade or in full sun.

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```
result <- xmlParse("plants.xml")
result1 <- xpathSApply(result,"/CATALOG/PLANT[ LIGHT = 'Sun' or LIGHT = 'Shade']")
result1
```

```
[[1]]
<PLANT>
  <COMMON>Violet, Dog-Tooth</COMMON>
  <BOTANICAL>Erythronium americanum</BOTANICAL>
  <ZONE>4</ZONE>
  <LIGHT>Shade</LIGHT>
  <PRICE>$9.04</PRICE>
  <AVAILABILITY>020199</AVAILABILITY>
</PLANT>

[[2]]
<PLANT>
  <COMMON>Trout Lily</COMMON>
  <BOTANICAL>Erythronium americanum</BOTANICAL>
  <ZONE>4</ZONE>
  <LIGHT>Shade</LIGHT>
  <PRICE>$6.94</PRICE>
  <AVAILABILITY>032499</AVAILABILITY>
</PLANT>

[[3]]
<PLANT>
  <COMMON>Adder's-Tongue</COMMON>
  <BOTANICAL>Erythronium americanum</BOTANICAL>
  <ZONE>4</ZONE>
  <LIGHT>Shade</LIGHT>
  <PRICE>$9.58</PRICE>
  <AVAILABILITY>041399</AVAILABILITY>
</PLANT>

[[4]]
<PLANT>
  <COMMON>Bee Balm</COMMON>
  <BOTANICAL>Monarda didyma</BOTANICAL>
  <ZONE>4</ZONE>
  <LIGHT>Shade</LIGHT>
  <PRICE>$4.59</PRICE>
  <AVAILABILITY>050399</AVAILABILITY>
</PLANT>

[[5]]
<PLANT>
  <COMMON>Bergamot</COMMON>
  <BOTANICAL>Monarda didyma</BOTANICAL>
  <ZONE>4</ZONE>
  <LIGHT>Shade</LIGHT>
  <PRICE>$7.16</PRICE>
  <AVAILABILITY>042799</AVAILABILITY>
</PLANT>

[[6]]
<PLANT>
  <COMMON>Buttercup</COMMON>
  <BOTANICAL>Ranunculus</BOTANICAL>
  <ZONE>4</ZONE>
  <LIGHT>Shade</LIGHT>
  <PRICE>$2.57</PRICE>
```

```
  <AVAILABILITY>061099</AVAILABILITY>
</PLANT>

[[7]]
<PLANT>
  <COMMON>Crowfoot</COMMON>
  <BOTANICAL>Ranunculus</BOTANICAL>
  <ZONE>4</ZONE>
  <LIGHT>Shade</LIGHT>
  <PRICE>$9.34</PRICE>
  <AVAILABILITY>040399</AVAILABILITY>
</PLANT>

[[8]]
<PLANT>
  <COMMON>Cinquefoil</COMMON>
  <BOTANICAL>Potentilla</BOTANICAL>
  <ZONE>Annual</ZONE>
  <LIGHT>Shade</LIGHT>
  <PRICE>$7.06</PRICE>
  <AVAILABILITY>052599</AVAILABILITY>
</PLANT>

[[9]]
<PLANT>
  <COMMON>Jacob's Ladder</COMMON>
  <BOTANICAL>Polemonium caeruleum</BOTANICAL>
  <ZONE>Annual</ZONE>
  <LIGHT>Shade</LIGHT>
  <PRICE>$9.26</PRICE>
  <AVAILABILITY>022199</AVAILABILITY>
</PLANT>

[[10]]
<PLANT>
  <COMMON>Greek Valerian</COMMON>
  <BOTANICAL>Polemonium caeruleum</BOTANICAL>
  <ZONE>Annual</ZONE>
  <LIGHT>Shade</LIGHT>
  <PRICE>$4.36</PRICE>
  <AVAILABILITY>071499</AVAILABILITY>
</PLANT>

[[11]]
<PLANT>
  <COMMON>California Poppy</COMMON>
  <BOTANICAL>Eschscholzia californica</BOTANICAL>
  <ZONE>Annual</ZONE>
  <LIGHT>Sun</LIGHT>
  <PRICE>$7.89</PRICE>
  <AVAILABILITY>032799</AVAILABILITY>
</PLANT>

[[12]]
<PLANT>
  <COMMON>Snakeroot</COMMON>
  <BOTANICAL>Cimicifuga</BOTANICAL>
  <ZONE>Annual</ZONE>
```

```
  <LIGHT>Shade</LIGHT>
  <PRICE>$5.63</PRICE>
  <AVAILABILITY>071199</AVAILABILITY>
</PLANT>

[[13]]
<PLANT>
  <COMMON>Cardinal Flower</COMMON>
  <BOTANICAL>Lobelia cardinalis</BOTANICAL>
  <ZONE>2</ZONE>
  <LIGHT>Shade</LIGHT>
  <PRICE>$3.02</PRICE>
  <AVAILABILITY>022299</AVAILABILITY>
</PLANT>
```

2.Put the result from the previous XPath query into a dataframe and then calculate the 10% trimmed mean of the prices.

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```
df<-xmlToDataFrame(result1)
df
```

COMMON <chr>	BOTANICAL <chr>	ZONE <chr>	LIG… <chr>	PRI… <chr>	AVAILABILITY <chr>
Violet, Dog-Tooth	Erythronium americanum	4	Shade	$9.04	020199
Trout Lily	Erythronium americanum	4	Shade	$6.94	032499
Adder's-Tongue	Erythronium americanum	4	Shade	$9.58	041399
Bee Balm	Monarda didyma	4	Shade	$4.59	050399
Bergamot	Monarda didyma	4	Shade	$7.16	042799
Buttercup	Ranunculus	4	Shade	$2.57	061099
Crowfoot	Ranunculus	4	Shade	$9.34	040399
Cinquefoil	Potentilla	Annual	Shade	$7.06	052599
Jacob's Ladder	Polemonium caeruleum	Annual	Shade	$9.26	022199
Greek Valerian	Polemonium caeruleum	Annual	Shade	$4.36	071499

1-10 of 13 rows Previous **1** 2 Next

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```
library(stringi)
mean(as.numeric(stri_replace_all_fixed(df$PRICE,"$","")), trim=0.1)
```

```
[1] 6.753636
```

Thank you!