# SIOB 296 Introduction to Programming with R

*Eric Archer (eric.archer@noaa.gov)*

*Homework Week 01: January 6, 2019*

Answer all questions in a script (.R) file. Use comments (`#` or `#'`).

1. Compute the following values:
27 times 38 minus 17 (= 1009)
natural logarithm of (56 divided by 4) (= 2.6390573)
square root of (4 times 13) (= 7.2111026)

2. Create the following vector and assign it to `q2`.

```
 [1] 4 5 6 7 3 5 6 7 8 1
```

3. Create the following vector and assign it to `q3`.

```
 [1]  0 10 15 20 25 30 35 40 45 50  4  6  5  4  3  1 10
```

4. Multiply every element in `q2` by 5 and assign it to `q4`.

```
 [1] 20 25 30 35 15 25 30 35 40  5
```

5. Remove the second and ninth element from `q4`.

```
[1] 20 30 35 15 25 30 35  5
```

6. What are the fifth, first, and eighth elements of the new `q4` vector in #5?

```
[1] 25 20  5
```

7. What is the sum of all elements in `q4` that are greater than 18?
The values:

```
[1] 20 30 35 25 30 35
```

Their sum:

```
[1] 175
```

8. Create this vector and assign it to `q8`:

```
 [1] 32 25 66 32 25 66 32 25 66 32 25 66
```

9. Create this vector and assign it to `q9`:

```
 [1] 32 32 25 25 66 66 32 32 25 25
```

10. Execute the script "temperature.r". Create a single named vector with the number of values of temperature are in the vector `temp` and what is their mean and standard deviation.

```
           n         mean      std.dev
77641.000000    14.576133     2.612531
```

11. Create a new named vector of state areas (called `areas`) using the values in the `state.name` vector to name the values in `state.area`.

| Alabama | Alaska | Arizona | Arkansas | California |
|---|---|---|---|---|
| 51609 | 589757 | 113909 | 53104 | 158693 |
| Colorado | Connecticut | Delaware | Florida | Georgia |
| 104247 | 5009 | 2057 | 58560 | 58876 |
| Hawaii | Idaho | Illinois | Indiana | Iowa |

|              |            |                |               |                |
|-------------:|-----------:|---------------:|--------------:|---------------:|
|         6450 |      83557 |          56400 |         36291 |          56290 |
|       Kansas |   Kentucky |      Louisiana |         Maine |       Maryland |
|        82264 |      40395 |          48523 |         33215 |          10577 |
| Massachusetts |   Michigan |      Minnesota |   Mississippi |       Missouri |
|         8257 |      58216 |          84068 |         47716 |          69686 |
|      Montana |   Nebraska |         Nevada | New Hampshire |     New Jersey |
|       147138 |      77227 |         110540 |          9304 |           7836 |
|   New Mexico |   New York | North Carolina |  North Dakota |           Ohio |
|       121666 |      49576 |          52586 |         70665 |          41222 |
|     Oklahoma |     Oregon |   Pennsylvania |  Rhode Island | South Carolina |
|        69919 |      96981 |          45333 |          1214 |          31055 |
| South Dakota |  Tennessee |          Texas |          Utah |        Vermont |
|        77047 |      42244 |         267339 |         84916 |           9609 |
|     Virginia | Washington |  West Virginia |     Wisconsin |        Wyoming |
|        40815 |      68192 |          24181 |         56154 |          97914 |

12. Using the `areas` vector from #11, what is the total area of Washington, Oregon, and California?

[1] 323866

13. Using the `areas` vector from #11, how many Rhode Islands can fit into California?

[1] 130.7191

14. Using the `state.abb` and `state.name` vectors, what is the abbreviation of Iowa?

[1] "IA"

15. Using the `state.abb` and `state.area` vectors, what are the abbreviations of states with areas greater than the mean area of all states?

```
 [1] "AK" "AZ" "CA" "CO" "ID" "KS" "MN" "MT" "NE" "NV" "NM" "OR" "SD" "TX" "UT"
[16] "WY"
```