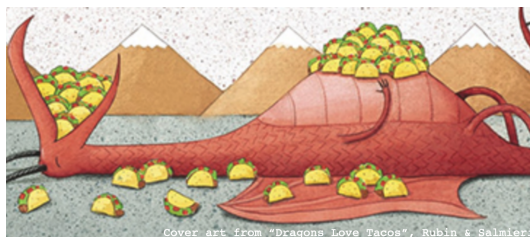


Homework 4



1. Consider the list `l = [2, 8, 45, 11, 5, 0]`. Check whether each element in the list is even and return the result, either `true` or `false`, using ...
 1. a `for` loop where you assign your variable to take the *index* of the loop,
 2. a `for` loop where you assign your variable to take the *values* in the list directly, and
 3. Also implement this in R.
2. Consider the lists `animals = ["penguins", "turtles", "dragons"]` and `foods = ["sandwiches", "ice cream", "tacos"]`. Use two `for` loops, one nested within another, and assigning the variables to take the *values* of the lists, to print the full set of sentence combinations of the form “penguins love sandwiches”, “penguins love ice cream”, ..., “turtles love tacos”.
3. Repeat this exercise but this time use a single `for` loop where the variable takes the *index* of the loop.
4. We saw in lecture that Python has a structure called an *iterator* that acts like a list for the purpose of iteration, but it doesn't actually allocate that full list. The example we saw was `range()`. Use the `enumerate()` iterator (see p. 55 in *Whirlwind*) to print out the index of the elements of `l`, their value, and if they're even.
5. Although the result won't be quite the same, repeat exercise 2 using the `zip()` iterator (see p. 56 in *Whirlwind*).
6. In R, create a simple linear model using whatever data set you like and call it `m1`. In addition to being an object of class `lm`, it is, more fundamentally a named list.
 1. Extract the names of the elements in the list.
 2. Extract the model coefficients in two ways: dollar-sign notation and square bracket notation by name. Are the results different? If so, how?
 3. Use the `summary()` method on `m1` to create a new list and call it `s1`. Extract the names of the elements of this list.
 4. Extract the `coefficient` element of `s1`. What is its type? Its class?

5. Using the fact that “Everything in R is a vector”, use single bracket vector subsetting to extract the p-value corresponding to the slope coefficient.