

# Introduction to Python

## Day Three Exercises

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### 1 Defining Functions

For this set of exercises, you will re-write some of yesterday's exercises as functions. The code doing the actual computation will remain virtually the same, except it will be written in the context of a function and subsequently called. **After you write each function, run it with 2-3 test cases to confirm that it works as expected!!**

1. In Texas, you can be a member of the elite "top 1%" if you make at least \$423,000 per year. Alternatively, in Hawaii, you can be a member once you start making at least \$279,000 per year! Finally, if you live in New York, you need to earn at least \$506,000 a year to make the cut.

Write a function to determine if a given salary is a "top-1%" salary in Texas, Hawaii, and/or New York. Your function should take a single argument, the salary, and *print* a sentence indicating in which state(s) this salary is and is not a top-1% salary. Your function should not return a value.

2. Write a function that returns a list of the powers (exponents 0-15) for a provided number. This function should take 1 argument: the number to raise to powers 0-15.
3. Write a function to curve a list of grades, silly-professor style. This function should take *four arguments*:
  - A list of grades to curve
  - The cutoff *above which* grades are reduced
  - The cutoff *below which* grades are raised
  - The scaling value

The function should return a list of curved grades.

4. Write a function to compute the molecular weight of a protein sequence. This function should take a single argument, a protein-sequence string, and it should return a single value, the molecular weight. Your function should account for the potential presence of ambiguous amino acids (again, compute these weights from average of all weights). Once your function is written, run it on the protein sequence "ABVPOXIRBTQQWS." Use this dictionary in your function:

```
amino_weights = {"A":89.09, "R":174.20, "N":132.12, "D":133.10, "C":121.15,
"Q":146.15, "E":147.13, "G":75.07, "H":155.16, "I":131.17, "L":131.17,
"K":146.19, "M":149.21, "F":165.19, "P":115.13, "S":105.09, "T":119.12,
"W":204.23, "Y":181.19, "V":117.15}
```

5. Write a function to determine if a sentence is an alliteration. Your function should take two arguments: the sentence and the alliteration letter. Your function should return the value `True` if the sentence is alliteration and `False` otherwise. Importantly, note that you can use an `if` statement to return different values under different conditions!