

Counting DNA Nucleotides

In this exercise, we'll count the frequency of the four nucleotide bases in a given string of DNA as described on the [Rosalind.info site](https://rosalind.info)^[1] Write a Python program called `dna.py` that will accept a single, required, positional argument that is a string of `dna` and print the number of times you see each of the bases A, C, G, and T (in that order) separated by spaces.

The program should print a brief usage when run with no input:

```
$ ./dna.py
usage: dna.py [-h] str
dna.py: error: the following arguments are required: str
```

Or a longer usage for the `-h` or `--help` flags:

```
$ ./dna.py -h
usage: dna.py [-h] str

Count DNA nucleotides

positional arguments:
  str          DNA

optional arguments:
  -h, --help  show this help message and exit
```

Examples of running:

```
$ ./dna.py A
1 0 0 0
$ ./dna.py C
0 1 0 0
$ ./dna.py G
0 0 1 0
$ ./dna.py T
0 0 0 1
$ ./dna.py AGCTTTTCATTCTGACTGCAACGGGCAATATGTCTCTGTGTGGATTAAAAAAGAGTGTCTGATAGCAGC
20 12 17 21
```

A passing test suite looks like this:

```

$ make test
pytest -xv test.py
===== test session starts =====
...
collected 11 items

test.py::test_exists PASSED [ 9%]
test.py::test_no_arg_and_usage PASSED [ 18%]
test.py::test_a_upper PASSED [ 27%]
test.py::test_a_lower PASSED [ 36%]
test.py::test_c_upper PASSED [ 45%]
test.py::test_c_lower PASSED [ 54%]
test.py::test_g_upper PASSED [ 63%]
test.py::test_g_lower PASSED [ 72%]
test.py::test_t_upper PASSED [ 81%]
test.py::test_t_lower PASSED [ 90%]
test.py::test_rosalind_example PASSED [100%]

===== 11 passed in 0.61s =====

```

NOTE

Solve this problem using only the skills you’ve learned up to chapter 3—that is, only using Python `str` methods.

[1] This is a website with various bioinformatics coding challenges. It’s named after Rosalind Franklin who should have gotten a Nobel Prize for her work on discovering the double-helix structure of DNA. Instead, she died early with little recognition of her contributions, but she did get this website named after her.