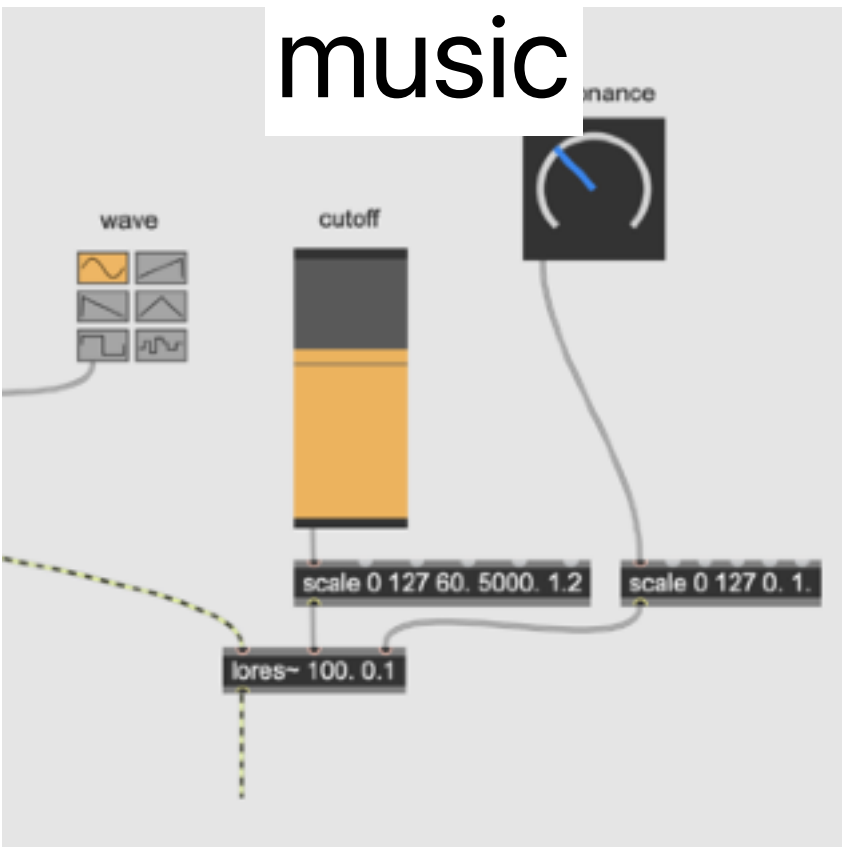


Programming Is Everywhere

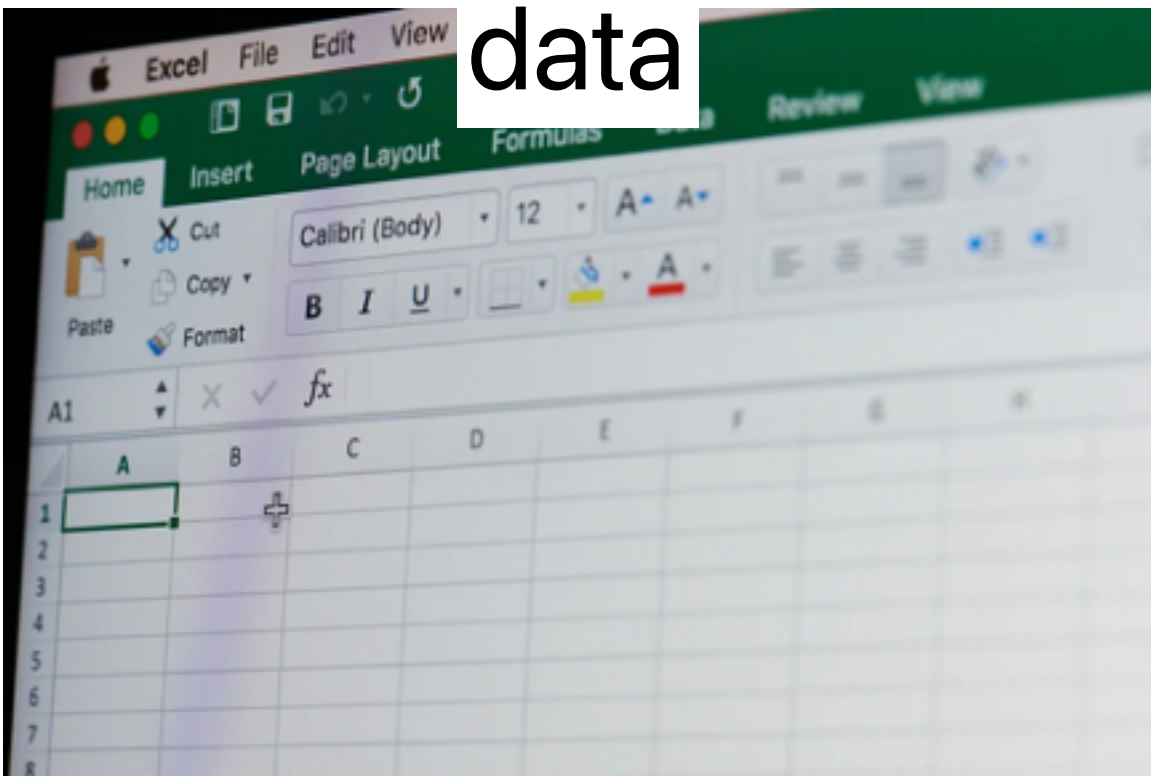
coding

```
501 using namespace std;
502
503 void merge(int a[], int temp[], int left, int mid, int right){
504     int i = left, j = mid, k = left;
505     while (i <= mid - 1 && j <= right){
506         if (a[i] <= a[j]){
507             temp[k++] = a[i++];
508         }else{
509             temp[k++] = a[j++];
510         }
511     }
512     while (i <= mid - 1) temp[k++] = a[i++];
513     while (j <= right) temp[k++] = a[j++];
514     for (i = left; i <= right; i++) a[i] = temp[i];
515 }
516
517 void mergesort(int a[], int temp[], int left, int right){
518     int mid = left + (right - left)/2;
519     if (right > left){
520         mergesort(a, temp, left, mid);
521         mergesort(a, temp, mid+1, right);
522         merge(a, temp, left, mid, right);
523     }
```

music



data



science

Simple spectra

An illustration of the [Discrete Fourier Transform](#) using windowing, to reveal the frequency content of a sound signal.

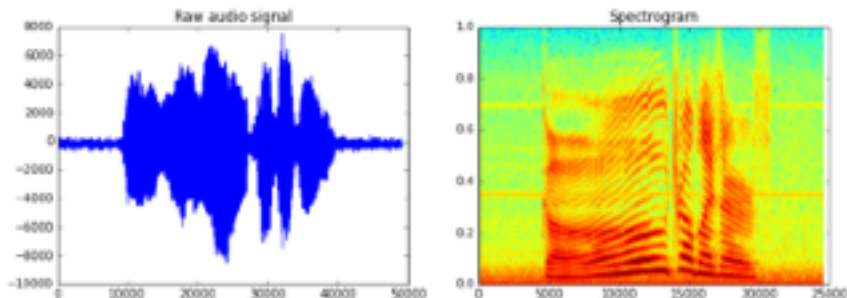
$$X_k = \sum_{n=0}^{N-1} x_n e^{-\frac{j2\pi kn}{N}} \quad k = 0, \dots, N-1$$

We begin by loading a datafile using SciPy's audio file support:

```
In [1]: from scipy.io import wavfile
rate, x = wavfile.read('test_mono.wav')
```

And we can easily view its spectral structure using matplotlib's builtin spectrogram routine:

```
In [2]: %matplotlib inline
from matplotlib import pyplot as plt
fig, (ax1, ax2) = plt.subplots(1, 2, figsize=(12, 4))
ax1.plot(x); ax1.set_title('Raw audio signal')
ax2.spectrogram(x); ax2.set_title('Spectrogram');
```



AI chat

ChatGPT ▾



python3, how do I access a file using relative path? let's say I'm in dir, and I need to access '../neighbor_dir/file.csv'

In Python 3, you can access a file using a relative path like this:

python

 Copy code

```
with open('../neighbor_dir/file.csv', 'r') as f:  
    data = f.read()
```

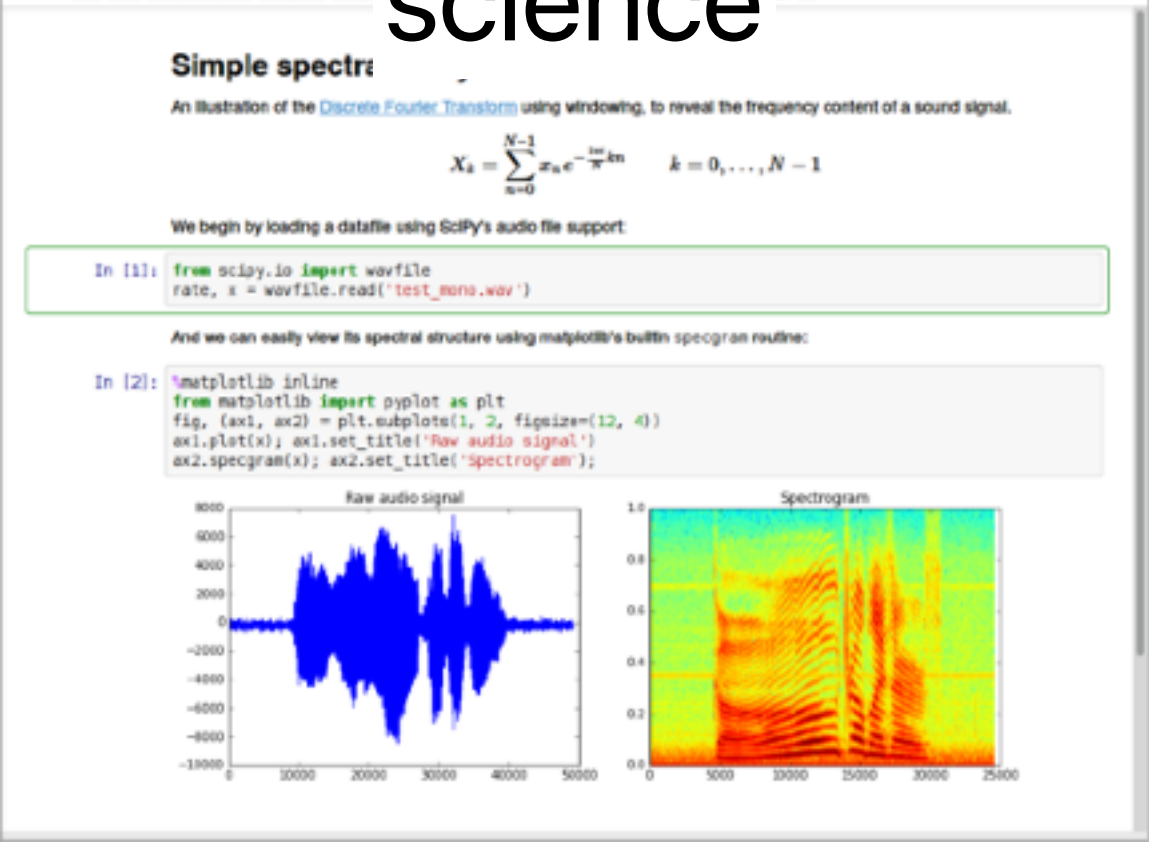


Programming Is Everywhere

coding

```
501 using namespace std;
502
503 void merge(int a[], int temp[], int left, int mid, int right)
504 {
505     int i = left, j = mid + 1, k = left;
506     while (i <= mid && j <= right)
507         if (a[i] <= a[j])
508             temp[k++] = a[i++];
509         else
510             temp[k++] = a[j++];
511     while (i <= mid) temp[k++] = a[i++];
512     while (j <= right) temp[k++] = a[j++];
513     for (i = left; i <= right; i++) a[i] = temp[i];
514 }
515
516 void mergesort(int a[], int temp[], int left, int right)
517 {
518     int mid = left + (right - left) / 2;
519     if (right > left)
520     {
521         mergesort(a, temp, left, mid);
522         mergesort(a, temp, mid + 1, right);
523         merge(a, temp, left, mid, right);
524     }
525 }
```

science

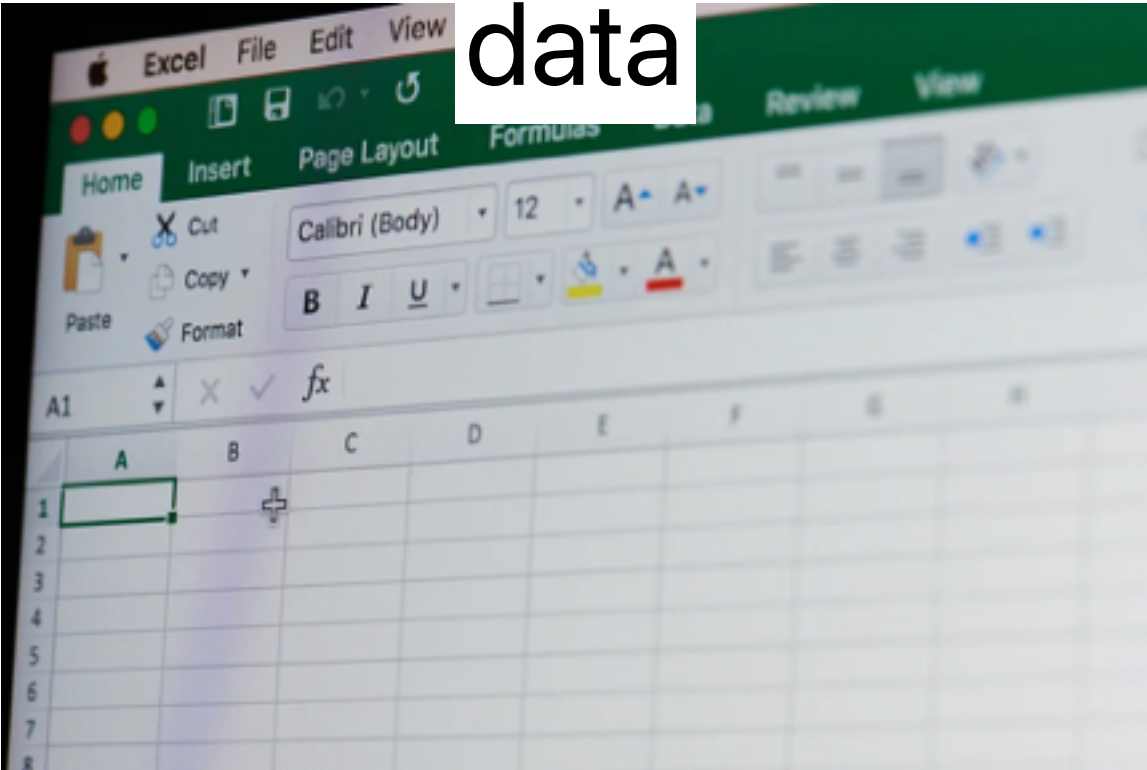


AI chat

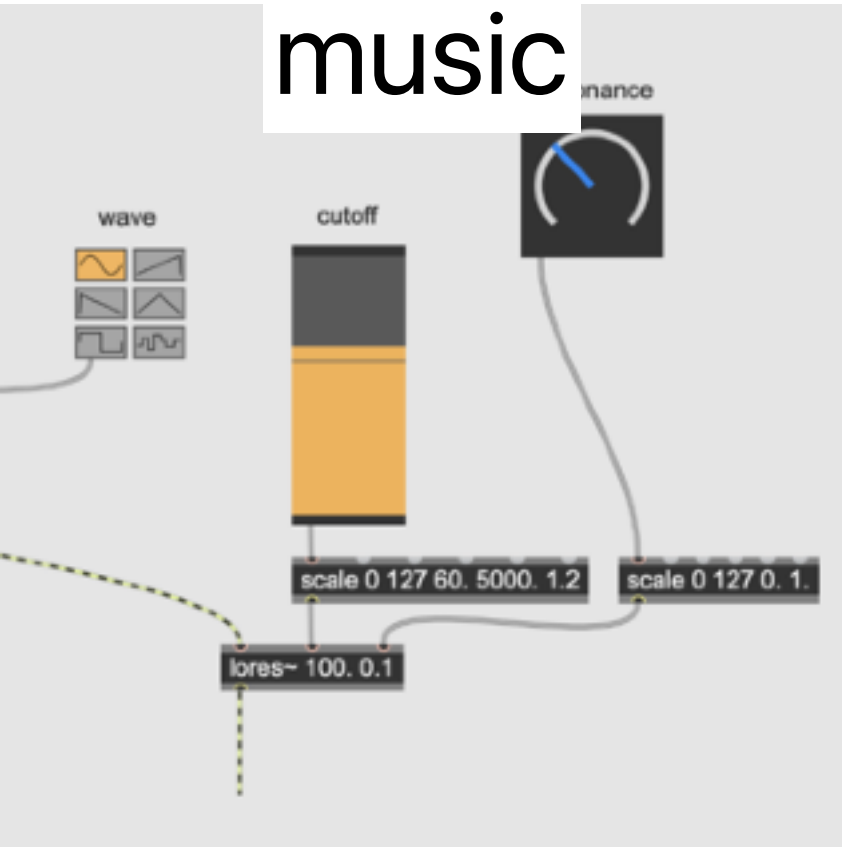
ChatGPT

python3, how do I access a file using relative path? let's say I'm in dir, and I need to access '../neighbor_dir/file.csv'

data



music



In Python 3, you can access a file using a relative path like this:

python

Copy code

```
with open('../neighbor_dir/file.csv', 'r') as f:
    data = f.read()
```

But Programming Systems Have Not Kept Up