Practice S05P07: Sound Processing I: Echo

http://www.comp.nus.edu.sg/~cs1010/4_misc/practice.html

Week of release: Week 5

Objectives: Array

Task statement:

A sound wave can be represented digitally as an array of integers. For example, the sound wave shown in Figure 1 can be represented as {1, 2, -1, -2, 1, 2, 0, -1, 1, 2, 1}.
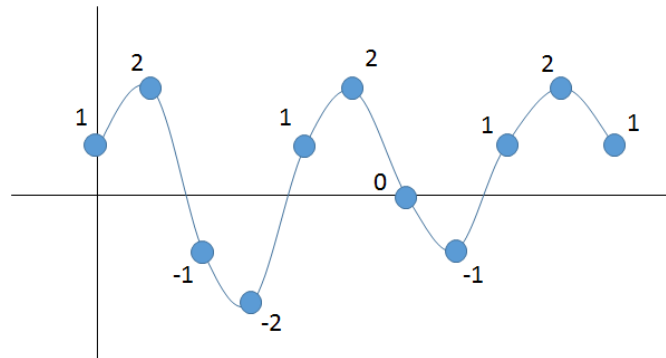

Figure 1

Given two integers k and p (both in [0, 100]), we can add echo effects to a sound wave by appending k copies of the sound wave, each of which is weakened by a decay value $p\%$ (i.e., the first copy is 1–$p\%$ of the original wave, the second copy is 1-$p\%$ of the first copy, and so on).

For example, to add **2** echoes a sound wave {4, 6, 8, 10}, each of which is weakened by a decay of **50**%, we append {2, 3, 4, 5} and {1, 1, 2, 2} to the given sound wave. The resulting array is hence {4, 6, 8, 10, 2, 3, 4, 5, 1, 1, 2, 2}.

Write a program **echo.c** to perform the following:

- Read in a positive integer value *size*, which indicates the number of integers in the given sound wave. You may assume that *size* is at most 100.

- Read in *size* integers, which represent the given sound wave.

- Read in two integers k and p (both in [0, 100]), which represent the number of echoes to be added, and how much the sound wave is weakened in each echo, respectively.

- Add the echo effects to the sound wave accordingly.

Your program should have a function called **scan()** to read in the size of the sound wave as well as the actual sound wave, and a function called **echo()** to add echo effects to the sound wave. A function called **print()** is given for printing a sound wave.

Sample run #1:

```
Enter size: 4
Enter values:
4 6 8 10
Enter number of echoes and decay percentage: 2 50
The sound wave with echoes added:
4 6 8 10 2 3 4 5 1 1 2 2
```

Sample run #2:

```
Enter size: 4
Enter values:
4 6 8 10
Enter number of echoes and decay percentage: 2 100
The sound wave with echoes added:
4 6 8 10 0 0 0 0 0 0 0 0
```

Sample run #3:

```
Enter size: 4
Enter values:
4 6 8 10
Enter number of echoes and decay percentage: 2 0
The sound wave with echoes added:
4 6 8 10 4 6 8 10 4 6 8 10
```

Sample run #4:

```
Enter size: 4
Enter values:
4 6 8 10
Enter number of echoes and decay percentage: 3 10
The sound wave with echoes added:
4 6 8 10 3 5 7 9 2 4 6 8 1 3 5 7
```