

Assignment #6

Inspecting and Generating Sequences

Write definitions for each of the following Python functions, and for each function, include a clear and concise comment to describe its purpose. Use only the Python topics covered so far in class.

1. `Powers(base, count)`

The list of the first 'count' powers of the number 'base', for 'count' a non-negative integer; efficiency need not be a concern here (you may use Python's '**' operator)

```
Powers( 2, 5 ) ⇒ [ 1, 2, 4, 8, 16 ]
Powers( 2, 0 ) ⇒ [ ]
Powers( -1, 8 ) ⇒ [ 1, -1, 1, -1, 1, -1, 1, -1 ]
Powers( 0.5, 5 ) ⇒ [ 1.0, 0.5, 0.25, 0.125, 0.0625 ]
```

2. `MagicNumbers(limit)`

The list of magic numbers below the integer 'limit'; here, a *magic number* is an integer, such as 6 (= 1+2+3), which equals the sum of all its positive factors, apart from itself

```
MagicNumbers( 500 ) ⇒ [ 6, 28, 496 ]
```

3. `MostComposite(integers)`

An element in the sequence 'integers' of positive integers which has the greatest number of distinct factors, or None if this sequence is empty; pay attention to efficiency here

```
MostComposite( [ 13, 16, 25, 34 ] ) ⇒ 16
MostComposite( range( 40 ) ) ⇒ 36
```

4. `Flatten(lsts)`

The list of all items in all lists in the list-of-lists 'lsts'

```
Flatten( [ [ 1, 2 ], [ 3 ], [ ], [ 2, 3, 4 ] ] ) ⇒ [ 1, 2, 3, 2, 3, 4 ]
```

Program Submission:

Store the function definitions in a file named 'a06.py', and turn it in for grading by typing:

```
submit-cs1117 a06.py
```

Due Date: Fri Oct 23, 11:00am