List Comprehensions

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def Double( numbers ) :

    # A copy of the numeric list 'numbers', with each item doubled

    return [ 2 * n for n in numbers ]

#-------------------------------------------------------------------------------

def Squares( limit ) :

    # The list of squares of positive integers up to that of 'limit'

    return [ n * n for n in range( 1, limit + 1 ) ]

#-------------------------------------------------------------------------------

def Positives( numbers ) :

    # The list of positive items in the numeric list 'numbers'

    return [ n for n in numbers if n > 0 ]

#-------------------------------------------------------------------------------

def Vowels( string ) :

    # The list of vowels in string 'string'

    return [ v for v in string if v in "AEIOUaeiou" ]

#-------------------------------------------------------------------------------

def Factors( n ) :

    # The list of positive factors of the positive integer 'n'

    return [ f for f in range( 1, n + 1 ) if n % f == 0 ]

#-------------------------------------------------------------------------------

def PrimesBelow( limit ) :

    # The list of prime numbers below the integer 'limit'

    return [ p for p in range( 2, limit ) if Factors( p ) == [ 1, p ] ]

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def Repetitions( n ) :

    # The list of lists of 'i' copies of the integer 'i',
    # for each value of 'i' from 0 up to the integer 'n'

    return [ [ i for _ in range( i ) ] for i in range( n + 1 ) ]

#-------------------------------------------------------------------------------

def Pairs( s1, s2 ) :

    # The list of 2-lists of items of sequences 's1' and 's2',
    # taken in all possible combinations

    return [ [ e1, e2 ] for e1 in s1 for e2 in s2 ]

#-------------------------------------------------------------------------------
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>>> Double( [ 4, 1, 3, 2 ] )
[8, 2, 6, 4]


>>> Squares( 10 )
[1, 4, 9, 16, 25, 36, 49, 64, 81, 100]


>>> Positives( [ 7, -2, -4, 3, 5, -1, 6, -8 ] )
[7, 3, 5, 6]


>>> Vowels( "All I Want Is You!" )
['A', 'I', 'a', 'I', 'o', 'u']

>>> Vowels( "floccipaucinihilipilification" )
['o', 'i', 'a', 'u', 'i', 'i', 'i', 'i', 'i', 'i', 'i', 'a', 'i', 'o']


>>> Factors( 15 )
[1, 3, 5, 15]

>>> Factors( 16 )
[1, 2, 4, 8, 16]

>>> Factors( 17 )
[1, 17]


>>> PrimesBelow( 50 )
[2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47]


>>> Repetitions( 5 )
[[], [1], [2, 2], [3, 3, 3], [4, 4, 4, 4], [5, 5, 5, 5, 5]]


>>> Pairs( "abc", "de" )
[['a', 'd'], ['a', 'e'], ['b', 'd'], ['b', 'e'], ['c', 'd'], ['c', 'e']]
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