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List Comprehension Examples:
- For each for loop expression write an equivalent list/dict/set comprehension

Basic Syntax: [ (i,j) for i in seq1 for j in seq2 if condition ]
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#Problem 1: function  $4x^2 - 4$ 
num_list = []
for i in range(-10,11):
    num_list.append(4*i**2 - 4)

#Problem 2: Normalize a list
num_list = [6,4,2,8,9,10,3,2,1,3]
total = float(sum(num_list))
for i in range(len(num_list)):
    num_list[i] = num_list[i]/float(total)

#Problem 3: Matrix of zeros
matrix = []
for i in range(10):
    matrix.append([0]*10)

#Problem 4: Multiplication table
table = []
for r in range(1,10):
    row = []
    for c in range(1,10):
        row.append(r*c)
    table.append(row)

#Problem 5: Mapping of powers of ten
powers = {}
for i in range(-6,7,3):
    powers[i] = 10**i

#Problem 6: Dictionary mapping integers to multiples under 100
multiples = {}
for n in range(1,11):
    multiples_list = []
    for i in range(1,101):
        if i%n == 0:
            multiples_list.append(i)
    multiples[n] = multiples_list

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