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1 # 2/2/2020 notes
2
3 # list of even numbers from 0 to 20 (included)
4 Z = list(range(0, 21, 2))
5 print(Z)
6
7 # user-defined function
8 def power2(x):
9     result = x ** 2
10    return(result)
11
12 # applying power2 to each element of the Z list
13 Z2 = list(map(power2, Z))
14 print(Z2)
15
16 # same as above but using lambda instead of power2
17 Z3 = list(map(lambda x: x ** 2, Z))
18 print(Z3)
19
20 # list comprehension
21 Z2LC = [i ** 2 for i in Z]
22 print(Z2LC)
23
24 # below is an example of a tuple comprehension which we then turn into a list
25 Z2LC = list(i ** 2 for i in Z)
26 print(Z2LC)
27 print()
28
29 # conditional statement inside map
30 cond_Z = list(map(lambda x: round(x ** 0.5, 3) if x % 4 == 0 else x + 1, Z))
31 print(cond_Z)
32 print()
33
34 # conditional statement inside list comprehension
35 cond_ZLC = [round(i ** 0.5, 3) if i % 4 == 0 else i + 1 for i in Z]
36 print(cond_ZLC)
37 print()
38
39 A = [1, 3, 6]
40 B = [3, 0, 2]
41
42 # goal:
43 # C = [1+3, 3+0, 6+2]
44
45 # two lists
46 C = list(map(lambda x, y: x + y, A, B))
47 print(C)
48
49 # a function that returns True or False
50 def even(x):
51     result = x % 2 == 0
52     return(result)
53
54 print(even(5))
55 print(even(6))
56
57 W = list(range(21))
58 print(W)

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59
60 # filter is similar to map but the input function must return a boolean
61 # the input function is applied to each element in W below (iterable object)
62 # then only the return values that are True will be displayed
63
64 W2 = list(filter(even, W))
65 print(W2)
66
```