

CS2302 - Data Structures - Spring 2023

Exercise - Analyzing running times

For all functions below, let L be a list, A an array, S a set, and D a dictionary. Let n be the length of the list, array, set, or dictionary. Determine the big-O running time with respect to n of each of the following functions:

```
def p1(A):
    print(A)

def p2(A):
    print(A.shape)

def p3(A):
    print(A[0])

def p4(A):
    print(np.sum(A))

def p5(A):
    print(A)
    for a in A:
        print(a)

def p6(A):
    print(A)
    for a in A:
        print(A)

def p7(L):
    print(L)
    print(len(L))
    print(L[0])
    for i in L:
        print(i)

def p8(L):
    P = []
    for item in L:
        for item in L:
            P.append((item,item))
    return P

def p9(L):
    return set(L)

def p10(L):
    return max(L)

def p11(L):
    return sorted(L)

def p12(L):
    return {item:i for i,item in enumerate(L)}

def p13(S):
    print(S)
```

```
def p14(S):
    print(S.union(S))

def p15(S):
    return list(S)

def p16(D):
    print(D)

def p17(D):
    print((D.get(2302)))

def p18(D):
    return list(D.keys())

def p19(S,L):
    count = 0
    for item in S:
        if item in L:
            count +=1
    return count

def p20(S,L):
    count = 0
    for item in L:
        if item in S:
            count +=1
    return count

def p21(S,L):
    for item in S:
        L.append(item)

def p22(L,D):
    return D[L[0]]

def p23(L,D):
    return [D.get(item) for item in L]

def p24(A,D):
    for i,a in enumerate(A):
        if D.get(a) is None:
            D[a] = i

def p25(L):
    D = {}
    for i,a in enumerate(L):
        D[a] = sum(L[i:])
    return D
```