ASSIGNMENT 10

#1

def e(b, c):

d = [b[i:i + 5] for i in range(0, len(b), 5)]

f = [sorted(x)[len(x) // 2] for x in d]

g = sorted(f)

return g[len(g) // 2] if len(g) <= 5 else e(g, len(g) // 2)

def a(b, c):

if len(b) <= 5:

return sorted(b)[c - 1]

h = e(b, c)

i = [x for x in b if x < h]

j = [x for x in b if x > h]

k = [x for x in b if x == h]

if c <= len(i):

return a(i, c)

elif c <= len(i) + len(k):

return h

else:

return a(j, c - len(i) - len(k))

b1, c1 = [12, 3, 5, 7, 19], 2

b2, c2 = [12, 3, 5, 7, 4, 19, 26], 3

b3, c3 = [1, 2, 3, 4, 5, 6, 7, 8, 9, 10], 6

print(a(b1, c1))

print(a(b2, c2))

print(a(b3, c3))

#2

def l(m):

return m[0] \* m[0] + m[1] \* m[1]

def n(o, p):

if len(o) <= 1:

return o

q = l(o[p])

r = [x for x in o if l(x) < q]

s = [x for x in o if l(x) > q]

t = [x for x in o if l(x) == q]

if p < len(r):

return n(r, p)

elif p < len(r) + len(t):

return r + t[:p - len(r)]

else:

return r + t + n(s, p - len(r) - len(t))

u1, v1 = [[1, 3], [-2, 2], [5, 8], [0, 1]], 2

u2, v2 = [[1, 3], [-2, 2]], 1

u3, v3 = [[3, 3], [5, -1], [-2, 4]], 2

print(n(u1, v1))

print(n(u2, v2))

print(n(u3, v3))

#3

def w(x, y, z, aa):

ab = {}

ac = 0

for a1 in x:

for a2 in y:

if a1 + a2 in ab:

ab[a1 + a2] += 1

else:

ab[a1 + a2] = 1

for a3 in z:

for a4 in aa:

if -(a3 + a4) in ab:

ac += ab[-(a3 + a4)]

return ac

x1, y1, z1, aa1 = [1, 2], [-2, -1], [-1, 2], [0, 2]

x2, y2, z2, aa2 = [0], [0], [0], [0]

print(w(x1, y1, z1, aa1))

print(w(x2, y2, z2, aa2))