Report

Table

Matrix	$\widehat{s}^{\mathrm{T}}$	Norms	Condition Number
A	$(1\ 1\ 1)$	0	39.913043
A1	$(1\ 1\ 1)$	0	25
A2	$(1\ 1\ 1)$	0	1025
B	$(1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1)$	0	400
B1	$(1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1)$	0	5088.876822
B2	$(1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1)$	0	172.492542
C	$(1\ 1\ 1\ 1\ 1)$	0	96811.458333
C1	$(1\ 1\ 1\ 1\ 1)$	0	1187.460829
C2	$(1\ 1\ 1\ 1\ 1)$	0	2206.076374
D	$(1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ \ldots\ 1)$	0	3820.002017
D1	$(1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ \ldots\ 1)$	0	3409.393418
D2	$(1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ \ldots\ 1)$	0	1350.15945
E	$(1\ 1\ 1\ 1\ 1\ 1\ 1)$	0	381
E1	$(1\ 1\ 1\ 1\ 1\ 1\ 1)$	0	69.586823
E2	$(1\ 1\ 1\ 1\ 1\ 1\ 1)$	0	109.652496
F	$(1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1)$	0	2229.303761
F1	$(1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1)$	0	551.238190
F2	$(1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1)$	0	165.046609
G	$(1\ 1\ 1)$	0	2655
G1	$(1\ 1\ 1)$	0	17.6
G2	$(1\ 1\ 1)$	0	10.079755
H	$(1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1)$	0	377.213512
H1	$(1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1)$	0	60.547863
H2	$(1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1)$	0	87.999289
I	$(1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1)$	0	50
I1	$(1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1)$	0	50
I2	$(1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1)$	0	50
J	$(1\ 1)$	0	9
J1	$(1\ 1)$	0	36
J2	$(1\ 1)$	0	4

The gardens provided a solid amount of variety between cases. I had to work to make the computations work for all the gardens in the set, including their rearrangements.

I rearranged most of the gardens by flattening the matrices into a single row, shuffling their elements, and then reconstructing a new, rearranged (and hopefully unique) matrix from the shuffled elements. For matrix I, I opted to simply shuffle the non-zero elements to make it easier.

I think the easiest and most straightforward part of this problem was implementing the different matrix operations necessary in Python. I simply needed to reconstruct them from the formulas that were already given. What I found difficult about the problem was how to specifically apply these implementations to supply the necessary data. I found that I had to work around the difference of how the computer understood the problem and how a human would normally solve and compute for the needed data.

Overall, I found the problem fairly challenging, and it inspired me to work harder on knowing how to apply my skills to computing.