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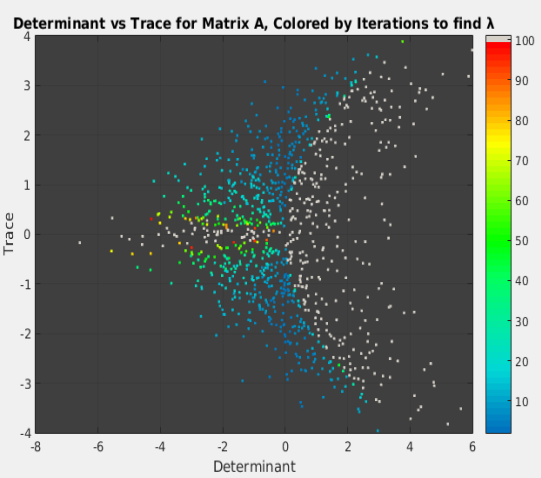
Part 3. d: Written explanation of graphs:

In part (c) we generated two scatter plots. They both contained points from 1000 matrices and were placed based on determinant and trace. The overall shape of these graphs is a parabola opening towards the positive x direction. The relationship in these two graphs can be seen through the trace of A^{-1} and the ((trace of A)/(determinant of A)). You can also see how the number of iterations required increases rapidly as the trace approaches zero. At its closest to zero the numbers end up reaching the maximum number of iterations due harder computations for the power method to compute, including complex numbers.



The heat map (colors based on number of iterations to obtain converging eigenvalue of A or A^{-1}) was very similar for both graphs as well. A color of blue indicated a low number of iterations, while red indicated a large number of iterations. A gray dot represents a point at which the eigenvalue could not be found- the max count was reached before a convergence occurred. There are several possible explanations for this, such as complex eigenvalues. Due to this factor, there are a large portion of results which return failure (count=100; color=gray) and can be seen on the right of each graph (Where the parabola opens towards x → infinity).

One interesting graph not shows, is the that of determinant and trace for the inverse of A (A^{-1}). While these show slight variations (due to only altering the *iteration count* to A^{-1}), the full inverse graph has more interesting results.