Let the $n$-dimensional matrix $A$, where the $(i, j)$-th element is defined as $i^2 + j^2$, for $i$ and $j$ both ranging from 1 to $n$. Write all numpy commands for the following:

1. Define $A$ as a numpy matrix, for $n = 17$.
   Let $b$ be a 17-dimensional vector of ones.

2. Solve the linear system $Ax = b$ with numpy. Verify the residual.
   Write the sum of the coordinates in the solution $x$. 