Convert axis-angle representation to a quaternion

Question

In this script, you need to convert axis-angle representation to quaternion form

- Your final solution for the quaternion representation must be stored in quat

Input Format

- vec is a 1x3 matrix of the form [x y z] for a vector xi + yj + zk with norm(vec) = 1
- theta will be a valid 1x1 rotation angle in radians

Output Format

- Your solution for quat must be a 1x4 matrix.
- If the quaternion is Qs + Qx i + Qy j + Qz k, it should be stored as [Qs, Qx, Qy, Qz]

Code

- Write your code in the space provided within the script, as per the script comments.

Helpful Notes

- If theta is the angle of rotation, and $\vec{r}$ is the rotation vector, the quaternion Q is represented as follows: Q = [cos(theta/2), $\vec{r}$ sin(theta/2)]