Step-1

Given $ax^2 + 2bxy + cy^2 > x^2 + y^2$.

$\Rightarrow (a-1)x^2 + 2bxy + (c-1)y^2 > 0 \ \forall x, y.$

Step-2

Let $F = (a-1)x^2 + 2bxy + (c-1)y^2$

We have to find conditions on a, b, c for which F is positive definite.

We know that $ax^2 + 2bxy + cy^2$ is positive definite if $a > 0$ and $ac > b^2$.

So the condition on a, b, c for which F is positive definite are

$(a-1) > 0$ and $(a-1)(c-1) > b^2.$

Therefore, the condition on a, b, c for which F is positive definite are $\boxed{a > 1 \text{ and } (a-1)(c-1) > b^2}$.