

```
In[*]:= Clear[e, H, X, Y, Comm];

e[i_, j_] := SparseArray[{{i, j} -> 1}, {3, 3}] // Normal;

H = -I e[2, 2] + I e[3, 3];
X = (e[1, 2] + e[1, 3]) / 2;
Y = I (e[1, 2] - e[1, 3]) / 2;

Comm[u_, v_] := u.v - v.u;

{Comm[H, X] == Y, Comm[H, Y] == -X, Comm[X, Y] == 0 X}

Out[*]=
{True, True, True}
```