

g-matrices of st-tilt(H_4)

[[1, 0, 0, 0],
 [0, 1, 0, 0],
 [0, 0, 1, 0],
 [0, 0, 0, 1]]

[[-1, 0, 0, 0],
 [0, -1, 0, 0],
 [0, 0, -1, 0],
 [0, 0, 0, -1]]

[[0, 1, 0, 0],
 [0, 0, 1, 0],
 [0, 1, 0, -1],
 [1, 0, 0, 0]]

[[0, 1, -1, 0],
 [0, 1, 0, 0],
 [0, 0, 0, 1],
 [1, 0, 0, 0]]

[[1, -1, 1, 1],
 [0, 0, 1, 0],
 [0, 0, 0, 1],
 [1, 0, 0, 0]]

[[-1, 1, 0, 0],
 [0, 1, 0, 0],
 [0, 0, 1, 0],
 [0, 0, 0, 1]]

[[0, 1, -1, 0],
 [0, 1, 0, 0],
 [0, 1, 0, -1],
 [1, 0, 0, 0]]

[[0, 0, 1, 0],
 [0, 0, 1, -1],
 [0, 1, 0, -1],

```

    [ 1, 0, 0, 0]]
-----
[[ -1, 1, 0, 0],
 [ 0, 1, 0, 0],
 [ 0, 0, 1, 0],
 [ 0, 1, 0, -1]]
-----
[[ 0, 0, -1, 1],
 [ 0, 1, -1, 0],
 [ 0, 0, 0, 1],
 [ 1, 0, 0, 0]]
-----
[[ -1, 1, 0, 0],
 [ 0, 1, -1, 0],
 [ 0, 1, 0, 0],
 [ 0, 0, 0, 1]]
-----
[[ 1, -1, 1, 1],
 [ 0, 0, 1, 0],
 [ 1, -1, 1, 0],
 [ 1, 0, 0, 0]]
-----
[[ 1, -1, 0, 1],
 [ 1, -1, 1, 1],
 [ 0, 0, 0, 1],
 [ 1, 0, 0, 0]]
-----
[[ 0, -1, 1, 1],
 [ 1, -1, 1, 1],
 [ 0, 0, 1, 0],
 [ 0, 0, 0, 1]]
-----
[[ 0, 0, 0, 1],
 [ 0, 0, 1, 0],
 [-1, 1, 0, 0],
 [-1, 0, 0, 0]]
-----
[[ 0, 1, -1, 0],
 [ 0, 1, 0, -1],
 [ 0, 1, -1, -1],
 [ 1, 0, 0, 0]]

```

[[-1, 1, 0, 0],
[0, 1, -1, 0],
[0, 1, 0, 0],
[0, 1, 0, -1]]

[[0, 1, 0, -1],
[0, 0, 1, -1],
[1, 0, 0, 0],
[0, 0, 0, -1]]

[[0, 0, 1, 0],
[1, -1, 1, 0],
[0, 0, 1, -1],
[1, 0, 0, 0]]

[[0, 0, 1, 0],
[-1, 1, 0, -1],
[0, 0, 1, -1],
[0, 1, 0, -1]]

[[-1, 1, 0, 0],
[0, 0, 1, 0],
[-1, 1, 0, -1],
[0, 1, 0, -1]]

[[0, 1, -1, 0],
[0, 0, -1, 1],
[1, 0, 0, 0],
[0, 0, -1, 0]]

[[1, -1, 0, 1],
[0, 0, -1, 1],
[0, 0, 0, 1],
[1, 0, 0, 0]]

[[-1, 1, -1, 0],
[0, 0, -1, 1],
[0, 1, -1, 0],
[0, 0, 0, 1]]

```

[[ -1,  1, -1,  0],
 [ -1,  1,  0,  0],
 [  0,  1, -1,  0],
 [  0,  0,  0,  1]]

```

```

-----
[[  1, -1,  0,  1],
 [  1, -1,  1,  1],
 [  1, -1,  1,  0],
 [  1,  0,  0,  0]]

```

```

-----
[[  0, -1,  1,  1],
 [  1, -1,  1,  1],
 [  0,  0,  1,  0],
 [  1, -1,  1,  0]]

```

```

-----
[[  0, -1,  1,  1],
 [  1, -1,  0,  1],
 [  1, -1,  1,  1],
 [  0,  0,  0,  1]]

```

```

-----
[[  0,  0,  0,  1],
 [  0,  0,  1,  0],
 [  0, -1,  1,  1],
 [ -1,  0,  0,  0]]

```

```

-----
[[ -1,  1, -1,  0],
 [  0,  0,  0,  1],
 [ -1,  1,  0,  0],
 [ -1,  0,  0,  0]]

```

```

-----
[[  0,  0,  1,  0],
 [ -1,  1,  0,  0],
 [ -1,  1,  0, -1],
 [ -1,  0,  0,  0]]

```

```

-----
[[  0,  1,  0, -1],
 [  1,  0,  0,  0],
 [  0,  1, -1, -1],
 [  0,  0,  0, -1]]

```

```

-----
[[  0,  1, -1,  0],

```

$$\begin{bmatrix} 1, & 0, & 0, & 0], \\ 0, & 1, & -1, & -1], \\ 0, & 0, & -1, & 0]] \end{bmatrix}$$

$$\begin{bmatrix} -1, & 2, & -1, & -1], \\ 0, & 1, & -1, & 0], \\ 0, & 1, & 0, & -1], \\ 0, & 1, & -1, & -1]] \end{bmatrix}$$

$$\begin{bmatrix} -1, & 2, & -1, & -1], \\ -1, & 1, & 0, & 0], \\ 0, & 1, & -1, & 0], \\ 0, & 1, & 0, & -1]] \end{bmatrix}$$

$$\begin{bmatrix} 1, & -1, & 1, & 0], \\ 0, & 0, & 1, & -1], \\ 1, & 0, & 0, & 0], \\ 0, & 0, & 0, & -1]] \end{bmatrix}$$

$$\begin{bmatrix} -1, & 1, & 0, & -1], \\ 0, & 1, & 0, & -1], \\ 0, & 0, & 1, & -1], \\ 0, & 0, & 0, & -1]] \end{bmatrix}$$

$$\begin{bmatrix} 0, & 0, & 1, & 0], \\ 0, & -1, & 1, & 0], \\ 1, & -1, & 1, & 0], \\ 0, & 0, & 1, & -1]] \end{bmatrix}$$

$$\begin{bmatrix} 0, & 0, & 1, & 0], \\ 0, & 0, & 1, & -1], \\ -1, & 1, & 0, & -1], \\ -1, & 0, & 0, & 0]] \end{bmatrix}$$

$$\begin{bmatrix} -1, & 2, & -1, & -1], \\ -1, & 1, & 0, & 0], \\ -1, & 1, & 0, & -1], \\ 0, & 1, & 0, & -1]] \end{bmatrix}$$

$$\begin{bmatrix} 1, & -1, & 0, & 1], \\ 0, & 0, & -1, & 1], \end{bmatrix}$$

$$\begin{bmatrix} 1, & 0, & 0, & 0], \\ 0, & 0, & -1, & 0]] \end{bmatrix}$$

$$\begin{bmatrix} -1, & 1, & -1, & 0], \\ 0, & 1, & -1, & 0], \\ 0, & 0, & -1, & 1], \\ 0, & 0, & -1, & 0]] \end{bmatrix}$$

$$\begin{bmatrix} 0, & -1, & 0, & 1], \\ 1, & -1, & 0, & 1], \\ 0, & 0, & -1, & 1], \\ 0, & 0, & 0, & 1]] \end{bmatrix}$$

$$\begin{bmatrix} 0, & 0, & 0, & 1], \\ 0, & 0, & -1, & 1], \\ -1, & 1, & -1, & 0], \\ -1, & 0, & 0, & 0]] \end{bmatrix}$$

$$\begin{bmatrix} -1, & 2, & -1, & -1], \\ -1, & 1, & -1, & 0], \\ -1, & 1, & 0, & 0], \\ 0, & 1, & -1, & 0]] \end{bmatrix}$$

$$\begin{bmatrix} 1, & -1, & 0, & 1], \\ 1, & -1, & 1, & 0], \\ 1, & 0, & 0, & 0], \\ 1, & -1, & 0, & 0]] \end{bmatrix}$$

$$\begin{bmatrix} 0, & -1, & 1, & 1], \\ 1, & -1, & 0, & 1], \\ 1, & -1, & 1, & 1], \\ 1, & -1, & 1, & 0]] \end{bmatrix}$$

$$\begin{bmatrix} 0, & -1, & 1, & 1], \\ 0, & 0, & 1, & 0], \\ 0, & -1, & 1, & 0], \\ 1, & -1, & 1, & 0]] \end{bmatrix}$$

$$\begin{bmatrix} 0, & -1, & 0, & 1], \\ 0, & -1, & 1, & 1], \\ 1, & -1, & 0, & 1], \end{bmatrix}$$

$$\begin{bmatrix} 0 & 0 & 0 & 1 \end{bmatrix}$$

$$\begin{bmatrix} 0 & -1 & 0 & 1 \\ 0 & 0 & 0 & 1 \\ 0 & -1 & 1 & 1 \\ -1 & 0 & 0 & 0 \end{bmatrix}$$

$$\begin{bmatrix} 0 & 0 & 1 & 0 \\ 0 & -1 & 1 & 1 \\ 0 & -1 & 1 & 0 \\ -1 & 0 & 0 & 0 \end{bmatrix}$$

$$\begin{bmatrix} -1 & 1 & -1 & 0 \\ -1 & 1 & 0 & 0 \\ -1 & 1 & 0 & -1 \\ -1 & 0 & 0 & 0 \end{bmatrix}$$

$$\begin{bmatrix} 0 & 1 & -1 & -1 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 0 & 0 & 0 & -1 \end{bmatrix}$$

$$\begin{bmatrix} -1 & 1 & 0 & -1 \\ 0 & 1 & 0 & -1 \\ 0 & 1 & -1 & -1 \\ 0 & 0 & 0 & -1 \end{bmatrix}$$

$$\begin{bmatrix} -1 & 1 & -1 & 0 \\ 0 & 1 & -1 & 0 \\ 0 & 1 & -1 & -1 \\ 0 & 0 & -1 & 0 \end{bmatrix}$$

$$\begin{bmatrix} -1 & 2 & -1 & -1 \\ -1 & 1 & 0 & -1 \\ 0 & 1 & 0 & -1 \\ 0 & 1 & -1 & -1 \end{bmatrix}$$

$$\begin{bmatrix} -1 & 1 & -1 & 0 \\ -1 & 2 & -1 & -1 \\ 0 & 1 & -1 & 0 \\ 0 & 1 & -1 & -1 \end{bmatrix}$$

$$\begin{bmatrix} 1 & -1 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 0 & -1 \end{bmatrix}$$

$$\begin{bmatrix} 0 & -1 & 1 & 0 \\ 1 & -1 & 1 & 0 \\ 0 & 0 & 1 & -1 \\ 0 & 0 & 0 & -1 \end{bmatrix}$$

$$\begin{bmatrix} 0 & 0 & 1 & -1 \\ -1 & 1 & 0 & -1 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 0 & -1 \end{bmatrix}$$

$$\begin{bmatrix} 0 & 0 & 1 & 0 \\ 0 & 0 & 1 & -1 \\ 0 & -1 & 1 & 0 \\ -1 & 0 & 0 & 0 \end{bmatrix}$$

$$\begin{bmatrix} -1 & 1 & -1 & 0 \\ -1 & 2 & -1 & -1 \\ -1 & 1 & 0 & 0 \\ -1 & 1 & 0 & -1 \end{bmatrix}$$

$$\begin{bmatrix} 1 & -1 & 0 & 1 \\ 1 & 0 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{bmatrix}$$

$$\begin{bmatrix} 0 & -1 & 0 & 1 \\ 1 & -1 & 0 & 1 \\ 0 & 0 & -1 & 1 \\ 0 & 0 & -1 & 0 \end{bmatrix}$$

$$\begin{bmatrix} 0 & 0 & -1 & 1 \\ -1 & 1 & -1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{bmatrix}$$


```

[[ 0, 0, 0, 1],
 [ 0, 0, -1, 1],
 [ 0, -1, 0, 1],
 [-1, 0, 0, 0]]

```

```

-----
[[ 1, -2, 1, 1],
 [ 1, -1, 0, 1],
 [ 1, -1, 1, 0],
 [ 1, -1, 0, 0]]

```

```

-----
[[ 1, -2, 1, 1],
 [ 0, -1, 1, 1],
 [ 1, -1, 0, 1],
 [ 1, -1, 1, 0]]

```

```

-----
[[ 1, -2, 1, 1],
 [ 0, -1, 1, 1],
 [ 0, -1, 1, 0],
 [ 1, -1, 1, 0]]

```

```

-----
[[ 1, -2, 1, 1],
 [ 0, -1, 0, 1],
 [ 0, -1, 1, 1],
 [ 1, -1, 0, 1]]

```

```

-----
[[ 0, -1, 0, 1],
 [ 0, -1, 1, 1],
 [ 0, -1, 1, 0],
 [-1, 0, 0, 0]]

```

```

-----
[[ -1, 1, -1, 0],
 [ -1, 1, 0, -1],
 [ -1, 1, -1, -1],
 [ -1, 0, 0, 0]]

```

```

-----
[[ -1, 1, -1, -1],
 [ 0, 1, -1, -1],
 [ 0, 0, -1, 0],
 [ 0, 0, 0, -1]]

```

```

-----
[[ 1, 0, 0, 0],

```

$$\begin{bmatrix} 1, & -1, & 0, & 0], \\ 0, & 0, & -1, & 0], \\ 0, & 0, & 0, & -1]] \end{bmatrix}$$

$$\begin{bmatrix} -1, & 1, & 0, & -1], \\ -1, & 1, & -1, & -1], \\ 0, & 1, & -1, & -1], \\ 0, & 0, & 0, & -1]] \end{bmatrix}$$

$$\begin{bmatrix} -1, & 1, & -1, & 0], \\ -1, & 1, & -1, & -1], \\ 0, & 1, & -1, & -1], \\ 0, & 0, & -1, & 0]] \end{bmatrix}$$

$$\begin{bmatrix} -1, & 1, & -1, & 0], \\ -1, & 2, & -1, & -1], \\ -1, & 1, & 0, & -1], \\ 0, & 1, & -1, & -1]] \end{bmatrix}$$

$$\begin{bmatrix} 0, & -1, & 1, & 0], \\ 1, & -1, & 1, & 0], \\ 1, & -1, & 0, & 0], \\ 0, & 0, & 0, & -1]] \end{bmatrix}$$

$$\begin{bmatrix} 0, & 0, & 1, & -1], \\ 0, & -1, & 1, & 0], \\ -1, & 0, & 0, & 0], \\ 0, & 0, & 0, & -1]] \end{bmatrix}$$

$$\begin{bmatrix} -1, & 1, & 0, & -1], \\ -1, & 1, & -1, & -1], \\ -1, & 0, & 0, & 0], \\ 0, & 0, & 0, & -1]] \end{bmatrix}$$

$$\begin{bmatrix} 0, & -1, & 0, & 1], \\ 1, & -1, & 0, & 1], \\ 1, & -1, & 0, & 0], \\ 0, & 0, & -1, & 0]] \end{bmatrix}$$

$$\begin{bmatrix} 0, & 0, & -1, & 1], \\ 0, & -1, & 0, & 1], \end{bmatrix}$$

$$\begin{bmatrix} -1, & 0, & 0, & 0], \\ [& 0, & 0, & -1, & 0]] \end{bmatrix}$$

$$\begin{bmatrix} -1, & 1, & -1, & 0], \\ [& -1, & 1, & -1, & -1], \\ [& -1, & 0, & 0, & 0], \\ [& 0, & 0, & -1, & 0]] \end{bmatrix}$$

$$\begin{bmatrix} 1, & -2, & 1, & 1], \\ [& 0, & -1, & 1, & 0], \\ [& 1, & -1, & 1, & 0], \\ [& 1, & -1, & 0, & 0]] \end{bmatrix}$$

$$\begin{bmatrix} 0, & -1, & 0, & 1], \\ [& 1, & -2, & 1, & 1], \\ [& 1, & -1, & 0, & 1], \\ [& 1, & -1, & 0, & 0]] \end{bmatrix}$$

$$\begin{bmatrix} 0, & -1, & 0, & 1], \\ [& 1, & -2, & 1, & 1], \\ [& 0, & -1, & 1, & 1], \\ [& 0, & -1, & 1, & 0]] \end{bmatrix}$$

$$\begin{bmatrix} 0, & -1, & 0, & 1], \\ [& 0, & -1, & 1, & 0], \\ [& -1, & 0, & 0, & 0], \\ [& 0, & -1, & 0, & 0]] \end{bmatrix}$$

$$\begin{bmatrix} -1, & 1, & -1, & -1], \\ [& -1, & 0, & 0, & 0], \\ [& 0, & 0, & -1, & 0], \\ [& 0, & 0, & 0, & -1]] \end{bmatrix}$$

$$\begin{bmatrix} 1, & -1, & 0, & 0], \\ [& 0, & -1, & 0, & 0], \\ [& 0, & 0, & -1, & 0], \\ [& 0, & 0, & 0, & -1]] \end{bmatrix}$$

$$\begin{bmatrix} -1, & 1, & -1, & 0], \\ [& -1, & 1, & 0, & -1], \\ [& -1, & 1, & -1, & -1], \end{bmatrix}$$

```

    [ 0, 1, -1, -1 ]]
-----
[[ 0, -1, 1, 0 ],
 [ 1, -1, 0, 0 ],
 [ 0, -1, 0, 0 ],
 [ 0, 0, 0, -1 ]]
-----
[[ 0, -1, 1, 0 ],
 [ -1, 0, 0, 0 ],
 [ 0, -1, 0, 0 ],
 [ 0, 0, 0, -1 ]]
-----
[[ 0, -1, 0, 1 ],
 [ 1, -1, 0, 0 ],
 [ 0, -1, 0, 0 ],
 [ 0, 0, -1, 0 ]]
-----
[[ 0, -1, 0, 1 ],
 [ -1, 0, 0, 0 ],
 [ 0, -1, 0, 0 ],
 [ 0, 0, -1, 0 ]]
-----
[[ 0, -1, 0, 1 ],
 [ 1, -2, 1, 1 ],
 [ 0, -1, 1, 0 ],
 [ 1, -1, 0, 0 ]]
-----
[[ 0, -1, 0, 1 ],
 [ 0, -1, 1, 0 ],
 [ 1, -1, 0, 0 ],
 [ 0, -1, 0, 0 ]]
-----
-----
-----

```