Task 3) I have a `[1,4]` matrix as `input`, and I need to turn it into a `[1,8]` matrix as `output` by matrix multiply in numpy.

```
import numpy as np
input = np.array([[1,2,3,4]])
output = np.array([[1,2,3,4,0,0,0,0]])
```

Please help me design the transformation matrix `G` I needed `(input @ G = output)`:

Task 4)

If I have an `output`:

```
output = np.array([[1,-1,1]])
```

And I know the transformation matrix is:

```
G = np.array([
    [1,1,0],
    [0,1,-1],
    [0,0,1]
])
```

Can you figure out what is the `input`? `(input @ G = output)`

Matrix recap week 6

Each success grants you one token, and a full success run grants you an "S" mark counting towards your final grade.

Your name: _____ Your Coe email: _____

Task 1) Here's the matrix multiply rule (next time I won't provide this rule for your reference):

$$M3 = M1 \times M2 = \begin{bmatrix} a_1 & b_1 \\ c_1 & d_1 \end{bmatrix} \times \begin{bmatrix} a_2 & b_2 \\ c_2 & d_2 \end{bmatrix} = \begin{bmatrix} a_1 \times a_2 + b_1 \times c_2 & a_1 \times b_2 + b_1 \times d_2 \\ c_1 \times a_2 + d_1 \times c_2 & c_1 \times b_2 + d_1 \times d_2 \end{bmatrix}$$

If I type this in python (Google Colab), what will be the answer?

```
import numpy as np
Q = np.array([
    [1,2],
    [3,4]
])

R = np.array([
    [1,0],
    [0,1]
])

Q@R
```

Task 2)

If I type this in python (Google Colab), what will be the answer?

```
import numpy as np
Q = np.array([
    [1,2],
    [3,4]
])

R = np.array([
    [1,0],
    [0,1]
])

Q+R
```