In [3]:
```python
import numpy as np
import matplotlib.pyplot as plt

# create a matrix to represent a drawing of '7'
x = np.zeros((8,8))
x[2,3:6] = 1
x[3,5] = 1
x[4:6,4] = 1

# display image
plt.imshow(np.round(x,0), cmap='gray_r'), plt.axis('off')
plt.show()
```
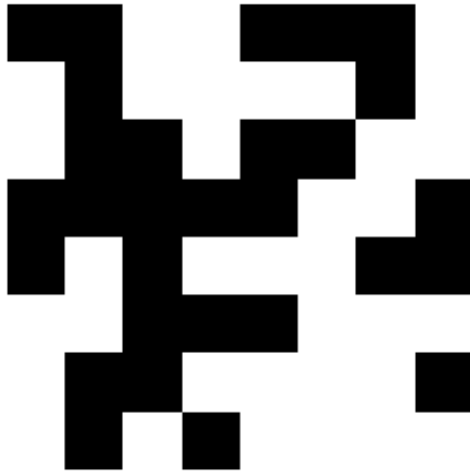


## 3a)

Answer is 7

In [4]:
```python
# generate a random 0 or 1
x = np.round(np.random.rand(1))
print('my random number: \n', x)
```

```
my random number:
 [0.]
```

In [6]:
```python
# generate a random 8x8 matrix
x = np.round(np.random.rand(8,8))
print('my random matrix: \n', x)

# display the matrix as an image
plt.imshow(x, cmap='gray_r'), plt.axis('off')
plt.show()
```

```
my random matrix:
 [[1. 1. 0. 0. 1. 1. 1. 0.]
 [0. 1. 0. 0. 0. 0. 1. 0.]
 [0. 1. 1. 0. 1. 1. 0. 0.]
 [1. 1. 1. 1. 1. 0. 0. 1.]
 [1. 0. 1. 0. 0. 0. 1. 1.]
 [0. 0. 1. 1. 1. 0. 0. 0.]
 [0. 1. 1. 0. 0. 0. 0. 1.]
 [0. 1. 0. 1. 0. 0. 0. 0.]]
```



## 3b)

It does not represent a handwritten digit

## 3c)

We build a collection of exsiting images each corresponding to a particular handwritten digit, then we generate a random index to select an element from this collection.

In [ ]: