Basic String/Sequence Search

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1. Frame Shift Method

This method of sequence search is very inefficient as we will be running the loop for (lenght(sequence)-length(search seqence))*length(search sequence)

Algorithm

Step 1: create variables for seqence and search string for example,
seq = "mopmountainmadmonkeymen" & searchseq = "mad"

Step 2: search for the 'search string' in 'sequence' by shifting the frame in each iteration for example,

```
           mopmountainmadmonkeymen
0          mad         ^^^
1           mad        ^^^
2            mad       ^^^
.                      ^^^
.                      ^^^
.                      ^^^
11                     mad
```

If the string we are searching for is avaiable in our sequence then we will get the position of it else we will get nothing or an error if we implement that functionality in our code.

In [1]:

```
# load modules
from matplotlib import pyplot as plt
```

In [2]:

```
# data
seq = "mopmountainmadmonkeymen"
searchseq = "mad"
```

In [3]:

```
# calculating length of sequence and search string
seq_len = len(seq)
searchseq_len = len(searchseq)
```

In [4]:

```
# frame shift searching
data = [[int(seq[i+j:i+j + 1] == searchseq[j:j + 1]) for j in range(searchseq_len)] for i in range(seq_len-search
seq_len)]
data
```

Out[4]:

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

In [5]:

```
# plotting just to visualize
plt.figure(figsize=(8, 8), dpi=80)
plt.imshow(data)
plt.xticks([xt for xt in range(searchseq_len)], searchseq)
plt.yticks([yt for yt in range(seq_len-searchseq_len)], [seq[i:i+searchseq_len] for i in range(seq_len-searchseq_
len)])
plt.show()
```