

COS226 Week 10 Activity

Algorithms 4th edition, Section 5.2 and 5.3

- Fill in the sorted suffixes and next[] columns of the table below.

i	Original Suffixes	Sorted suffixes	next[]
0	B A N A N A		
1	A N A N A B		
2	N A N A B A		
3	A N A B A N		
4	N A B A N A		
5	A B A N A N		

- Give the KMP DFA for the pattern MAMAMIA over the 3 letter alphabet by filling in the table below. Draw the DFA too.

	m	a	m	a	m	i	a
0	1	2	3	4	5	6	
a	0	2					
i	0	0					
m	1	1					

- Give the trace using Boyer-Moore to search for the pattern BANANA in the text

PINEAPPLESMANGOSANDBANANAS

by completing the table below.

i	j	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
		P	I	N	E	A	P	P	L	E	S	M	A	N	G	O	S	A	N	D	B	A	N	A	N	A	S

4. Build an R-way trie for the key-value pairs assuming $R = 5$: bad 1, bald 2, banana 3.
5. Build an 3-way trie for the same 3 key-value pairs.

6. The following is a Burrows-Wheeler encoding for you to decode.

```
% java BurrowsWheeler - < secretMessage.txt | java HexDump
```

```
00 00 00 0f 64 65 61 64 3a 20 20 68 6e 6f 76 77
65 6b 20 29 65 65 6f 67 61 20
26 bytes
```

	sorted[]	next []	message
0	20	5	
1	20	6	
2	20		
3	20		
4	29)	
5	3a	:	
6	61	a	
7	61	a	
8	64	d	
9	64	d	
10	65	e	
11	65	e	
12	65	e	
13	65	e	
14	67	g	
15	68	h	
16	6b	k	
17	6e	n	
18	6f	o	
19	6f	o	
20	76	v	
21	77	w	