

Assignment 5 Problem 3

- Compute the failure array for the pattern $P = \text{ababac}$.
- Show how to search for pattern $P = \text{ababac}$ in the text $T = \text{abcaabaabababacabcaa}$ using the KMP algorithm. Indicate in a table such as Table 1 which characters of P were compared with which characters of T . Follow the example on slide 27 in module 8. Place each character of P in the column of the compared-to character of T . Put brackets around the character if an actual comparison was not performed. You may not need all space in the table.

solution:

- a)** Let the failure array be F , then

$$F[0] = 0$$

$$F[1] = 0$$

$$F[2] = 1$$

$$F[3] \equiv 2$$

$$F[4] \equiv 3$$

$$F[5] = 0$$

- b)**

	$j=0$		$j=0$		$j=0$		$j=1$		$j=2$		$j=3$		$j=3$		$j=4$		$j=5$			
	$j=0$	$j=1$	$j=2$	$j=0$	$j=1$	$j=1$	$j=2$	$j=3$	$j=1$	$j=2$	$j=3$	$j=4$	$j=5$	$j=4$	$j=5$	$j=4$	$j=5$			
	$i=0$	$i=1$	$i=2$	$i=3$	$i=4$	$i=5$	$i=6$	$i=7$	$i=8$	$i=9$	$i=10$	$i=11$	$i=12$	$i=13$	$i=14$					
	a	b	c	a	a	b	a	a	b	a	b	a	b	a	c	a	b	c	a	a
	a	b	a																	
new $j=0$			a																	
new $j=0$				a	b															
new $j=0$					a	b	a	b												
new $j=1$							(a)	b												
new $j=0$								a	b	a	b	a	c							
new $j=3$									(a)	(b)	(a)	b	a	c						

Table 1: Table for KMP problem.