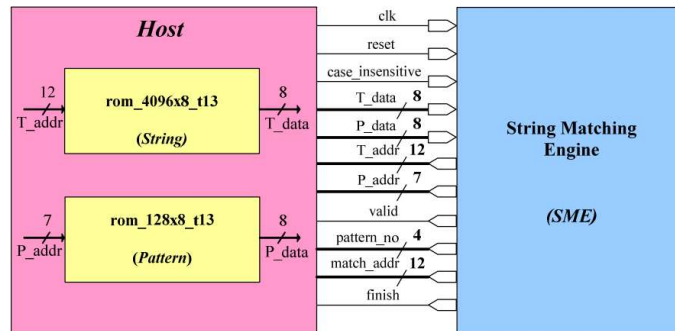


## (14) String Matching Engine

### 甲、摘要

設計一 String Matching Engine 電路設計，可將整篇文章的字串依指定的關鍵字樣本，搜尋該文章所有字元，並輸出符合題目指定 Pattern 的第一個字元記憶體位址及編號。



圖一、系統方塊圖

### 乙、想法

除了一般在 String 內找出符合 pattern 的 Sub-string 外，還要考慮四種特殊符號字元，以及 case\_insensitive 是否為 1(大、小寫英文字母視為相同與否)，並輸出符合 pattern 的 string index 及編號。

特殊符號說明	
?	前一字元比對零次或一次
.	比對任意字元
^	比對字串開頭
\$	比對字串結尾

圖二、四種特殊符號字元

### 丙、結果

Little Redcap

The wolf lifted the latch the door sprang open and without saying a word he went straight to the grandmothers bed and devoured her Then he put on her clothes dressed himself in her cap laid himself in bed and drew the curtains

:

:

So now the wretch went for the third time to the housedoor knocked at it and said Open the door for me children your dear little mother has come home and has brought every one of you something back from the forest with her The little kids cried First show us your paws that we may know if you are our dear little mother

圖三、長篇文章 String 局部內容(4020 字元)

本題第一組 Pattern，內容如下：

P	Pattern0	L	i	t	t	l	e										
	Pattern1	g	r	a	n	d	m	o	t	h	e	r					
	Pattern2	h	i	m	s	e	l	f									
	Pattern3	T	h	e		b	e	t	t	e	r				t	o	
	Pattern4	m	o	t	h	e	r										
	Pattern5	t	o														
	Pattern6	a	n	d													
	Pattern7	T	h	e	y	?											
	Pattern8	s	e	e	?												
	Pattern9	h	a	d	?												
	Pattern10	w	?	h	e	n											
	Pattern11	w	o	.													
	Pattern12	.			c	h	i	l	d								
	Pattern13	^	T														
	Pattern14	d	\$														

本題第二組 Pattern，內容如下：

P	Pattern0	o	.	g	?	h	?	t									
	Pattern1	s	o	m	?	e	?	.	h	?	i	?	.				

圖四、三組測試 pattern(一組隱藏測資)

```

***** The Summary of String matching *****
-----
pass :      247
error :      0
miss :      0
-----
Congratulations! All data have been generated successfully!
-----PASS-----
Simulation complete via $finish(1) at time 2719090 NS + 0

```

```

***** The Summary of String matching *****
-----
pass :      341
error :      0
miss :      0
-----
Congratulations! All data have been generated successfully!
-----PASS-----

```

```

***** The Summary of String matching *****
-----
pass :      43
error :      0
miss :      0
-----
Congratulations! All data have been generated successfully!
-----PASS-----
Simulation complete via $finish(1) at time 363580 NS + 0

```

圖五六七、通過測試樣本並且等級 A