計算機韌體實驗（P04）
迴文詞/Palindromes

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解題要訣

- 使用字串常數記錄對應的鏡像字元
  – ASCII碼的應用
- 字串常數陣列

字串常數

- 字元常數陣列，但最後一個須為終止字元'\0'
  - 使用字元指標(pointer)指向字串常數的第一個字元
  - 例：

```
11 char *rev = "A   3  HIL JM O   2TUVWXY51SE Z  8 "; //注意空白字元的數目
```

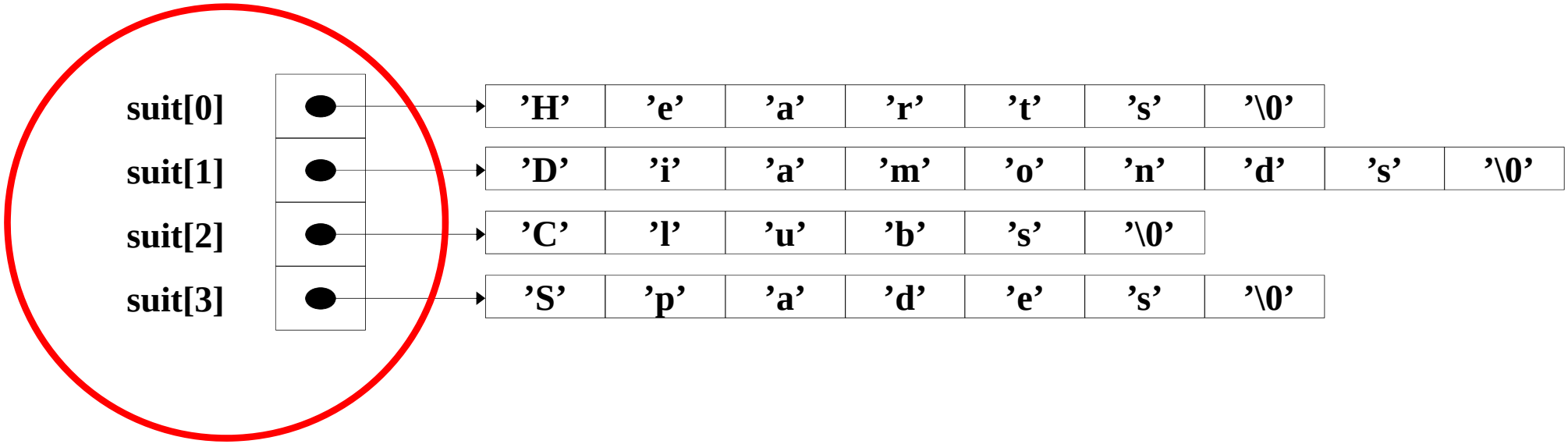
```
66 char mirrored(char ch) //傳回字元的鏡像
67 {
68     if(isalpha(ch)){ Lib.
69         return rev[ch-'A'];
70     }else{
71         return rev[ch-'0'+25];
72     }
73 }
```

指標陣列 (1/2)

- Arrays can contain pointers
  - Commonly used to store an array of strings
    - E.g. char *suit[4] = {"Hearts",
      "Diamonds",
      "Clubs",
      "Spades" };
  - Each element of suit is a pointer to a string (char *)
  - The strings are not in the array, only pointers to the strings are in the array

指標陣列 (2/2)

array suit of type char * ⇒ suit is of type char **



- array **suit** has a fixed size; but strings can be of any size (length)

字串常數陣列

- 例：

```
12 char *meg[] = {"not a palindrome",
13                "a regular palindrome",
14                "a mirrored string",
15                "a mirrored palindrome"};
```

短路運算(Short-Circuit)

```
29      while(scanf("%s", s) == 1){
30          length = strlen(s); Lib.
31          p = m = 1;
32
33          for(i=0; i < (double)length/2; i++){//注意轉型
34              if(p && s[i] != s[(length-1)-i]){//short-circuit
35                  p = 0;
36              }
37              if(m && mirrored(s[i]) != s[(length-1)-i]){
38                  m = 0;
39              }
40          }
41
42          printf("%s -- is %s.\n\n", s, meg[m*2+p]);
43      }
```

Lib. Functions

- int isalpha(int c);
  - Return true if *c* is a letter; otherwise, false
- size_t strlen(char *s);
  - Return the length of string s
  - size_t is an alias of unsinged int