

CH08 Structure

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Struct

- 可以將相關但不同類型的資料包在一起

//定義結構

```
struct card {  
    char suit; //花色  
    int face;  //數值  
};
```

宣告與使用

```
1 #include <stdio.h>
2 #include <stdlib.h>
3 //定義結構
4 struct card {
5     char suit; //花色
6     int face;  //數值
7 };
8 //定義別名
9 typedef struct card Card;
10
11 int main() {
12     struct card card01;
13     Card card02;
14     Card card03 = {'S', 1};
15
16     printf("%c%2d\n", card03.suit, card03.face);
17
18     system("pause");
19     return 0;
20 }
```

```
$ 1
請按任意鍵繼續 . . . _
```

*CH08 EX01.cpp

struct array

```
3  //定義結構
4  struct card {
5      char suit;  //花色
6      int face;  //數值
7  };
8  //定義別名
9  typedef struct card Card;
10
11 int main() {
12     //示範結構陣列
13     Card cards[52];
14 }
```

	suit	face
cards[0]		
cards[1]		
cards[2]		
cards[3]		
cards[4]		
:	:	:

*CH08 Pro01.cpp

練習題01

- 請使用結構存撲克牌，印出52張牌

```
S 1, S 2, S 3, S 4, S 5, S 6, S 7, S 8, S 9, S10, S11, S12, S13,  
H 1, H 2, H 3, H 4, H 5, H 6, H 7, H 8, H 9, H10, H11, H12, H13,  
D 1, D 2, D 3, D 4, D 5, D 6, D 7, D 8, D 9, D10, D11, D12, D13,  
C 1, C 2, C 3, C 4, C 5, C 6, C 7, C 8, C 9, C10, C11, C12, C13,  
請按任意鍵繼續 . . .
```

S: Spade (黑桃) ♠
H: Heart (愛心) ♥
D: Diamond (方塊) ♦
C: Club (梅花) ♣

*只要52全出來就好



pointer + struct

```
1 #include <stdio.h>
2 #include <stdlib.h>
3 //定義結構
4 struct card {
5     char suit; //花色
6     int face;  //數值
7 };
8 //定義別名
9 typedef struct card Card;
10
11 int main() {
12     Card card01 = {'S', 1};
13     Card *card02 = &card01;
14
15     printf("%c%2d\n", (*card02).suit, (*card02).face);
16     printf("%c%2d\n", card02->suit, card02->face);
17
18     system("pause");
19     return 0;
20 }
21
```

\$ 1

\$ 1

請按任意鍵繼續 . . .

struct + function

```
10 //傳值呼叫(整個複製)
11 void printCard(Card card) {
12     printf("%c%2d\n", card.suit, card.face);
13 }
14 //傳址呼叫
15 void printCard_V2(Card *card) {
16     printf("%c%2d\n", card->suit, card->face);
17 }
18 //傳參考呼叫(C++)
19 void printCard_V3(Card &card) {
20     printf("%c%2d\n", card.suit, card.face);
21 }
22
23 int main() {
24     Card card01 = {'S', 1};
25     printCard(card01);
26     printCard_V2(&card01);
27     printCard_V3(card01);
28 }
```

*CH08 EX03.cpp

Enum

- 列舉：提高程式碼可讀性

```
4  enum suits {  
5      Spade, Heart, Diamond, Club  
6  };  
7  
8  typedef enum suits Suits;  
9  
10 struct card {  
11     Suits suit; //花色  
12     int face;   //數值  
13 };  
14  
15 typedef struct card Card;  
16  
17 int main() {  
18     Card card01 = {Diamond, 1};  
19     printf("%d %2d\n", card01.suit, card01.face);  
20     system("pause");  
21     return 0;  
22 }  
23
```

```
2  1  
請按任意鍵繼續 . . .
```

*CH08 EX04.cpp

struct + struct

```
4  enum suits {  
5      Spade, Heart, Diamond, Club  
6  };  
7  typedef enum suits Suits;  
8  
9  struct card {  
10     Suits suit; //花色  
11     int face;   //數值  
12 };  
13 typedef struct card Card;  
14  
15 struct player {  
16     char name[10];  
17     Card crads[52];  
18 };  
19 typedef struct player Player;  
20  
21 int main() {  
22     Player players[4];  
23  
24     system("pause");  
25     return 0;  
26 }
```

*CH08 EX05.cpp

練習題02

- 將一組牌洗牌，並發給四個玩家

```
player 0:  
[c 8][d 0][s 2][s 11][s 5][d 7][h 10][h 12][s 0][h 11][s 1][h 2][c 5]  
player 1:  
[c 10][c 1][h 3][d 8][s 6][d 12][d 4][s 4][h 6][d 6][s 7][h 7][h 8]  
player 2:  
[d 3][c 11][d 5][c 2][d 2][h 5][s 9][d 1][c 12][d 9][c 3][h 0][s 10]  
player 3:  
[c 9][c 6][s 12][h 1][s 3][h 9][d 11][c 4][h 4][d 10][s 8][c 0][c 7]  
請按任意鍵繼續 . . .
```