Phill-CPP-0412

結構

- 陣列同質性
- 異質性資料

```
#include <iostream>
using namespace std;

int main()
{
    struct Address{
      const char *name;
      int number;
      const char *street;
      const char *city;
      const char *zip;
    }; //; 收尾

    Address a ={ //變數的宣告, 初始化
      "Phill Liu",
      1,
      "Neihu",
      "Taipei",
      "114"
    };

    cout << a.name << a.number << a.zip << endl;

    return 0;
}
```

struct → pointer 怎麼辦

pointer of struct

```
#include <iostream>
using namespace std;

int main()
{
    struct Address{
      const char *name;
      int number;
      const char *street;
      const char *city;
      const char *zip;
    }; //; 收尾
```

```
    Address a ={ //變數的宣告, 初始化
      "Phill Liu",
      1,
      "Neihu",
      "Taipei",
      "114"
    };

    Address* ptr_a = &a;

    cout << &a <<endl;
    cout << ptr_a << endl;

    cout << ptr_a->name << endl; // struct pointer dereference
    // cout << a.name << a.number << a.zip << endl;

    return 0;
}
```

struct + array

```
int main()
{
    struct SportCar{
      const char *brand;
      const char *model;
      int topSpeed;
    }; //; 收尾

    const int ARRAY_SIZE=3;

    SportCar a[ARRAY_SIZE] ={
      {"Ferrari", "F8 Tributo", 211},
      {"Lamborghini", "Huracan EVO", 202},
      {"Porche", "911 GT3", 197}
    };

    for (int i=0; i<ARRAY_SIZE; i++){
      cout << a[i].brand <<" "<< a[i].model <<" " <<a[i].topSpeed<<endl;
    }

    return 0;
}
```

練習

算出這三台車的平均速度

```
#include <iostream>
using namespace std;

int main()
{
    struct SportCar{
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    const int ARRAY_SIZE=3;

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      {"Ferrari", "F8 Tributo", 211},
      {"Lamborghini", "Huracan EVO", 202},
      {"Porche", "911 GT3", 197}
    };

    for (int i=0; i<ARRAY_SIZE; i++){
      cout << a[i].brand <<" "<< a[i].model <<" " <<a[i].topSpeed<<endl;
    }

    int totalspeed=0;
    for (int i=0; i<ARRAY_SIZE; i++){
      totalspeed += a[i].topSpeed;
    }
    cout << static_cast<double>(totalspeed)/ARRAY_SIZE << endl;

    return 0;
}
```

改成指標版

```
#include <iostream>
using namespace std;

int main()
{
    struct SportCar{
      const char *brand;
      const char *model;
      int topSpeed;
    }; //; 收尾

    const int ARRAY_SIZE=3;

    SportCar a[ARRAY_SIZE] ={
      {"Ferrari", "F8 Tributo", 211},
      {"Lamborghini", "Huracan EVO", 202},
      {"Porche", "911 GT3", 197}
    };

    for (int i=0; i<ARRAY_SIZE; i++){
```

```
      cout << a[i].brand <<" "<< a[i].model <<" " <<a[i].topSpeed<<endl;
    }

    int totalspeed=0;
    SportCar *ptr = a;

    for (int i=0; i<ARRAY_SIZE; i++){
      totalspeed += ptr-> topSpeed;
      ++ptr;
    }
    cout << static_cast<double>(totalspeed)/ARRAY_SIZE << endl;

    return 0;
}
```

小專案

- 華納威秀 電影院座位預定系統
- seat → struct → int seatNumber, bool isReserved
- 初始化
- 印出目前電影座位狀況
- makeReserve(Seat* array, int seatNumber)
- 萬一已預訂回結果
- 失敗讓重新預定