

計算機概論期末報告

電機一乙 11128245 陳昱宇 期末報告

:::info

計算機概論期末報告 URL :

https://hackmd.io/@Gr_p1-7DR8e3VBcMXbAVwg/BJUcXQJln

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Weekly Learning Record

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5/2 Pointer 1

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Weekly Learning Record

期末報告專案 演唱會購票系統

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Homework

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Bash + Git note

購票系統主頁面

購票系統標頭檔

購買一張門票(Function 2)

退回一張門票(Function 3)

呈現已購買之位置及人名(Function 4)

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專題之結論心得

結論&心得

- URL : https://hackmd.io/@Gr_p1-7DR8e3VBcMXbAVwg/B1efjwy07h

HackMD Note

Syntax: markdown language

Register an account of HackMD

1. go to [Hacked](#)

Pointer note

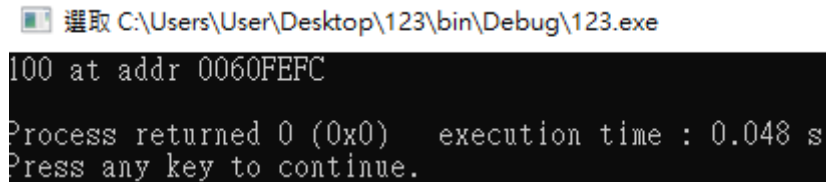
Point address

- first test program

```
#include <stdio.h>

int main()
{
    int n = 100;
    printf("%d at addr %p\n", n, &n);
    return 0;
}
```

- the result is like the following :



```
100 at addr 0060FEFC
Process returned 0 (0x0)   execution time : 0.048 s
Press any key to continue.
```

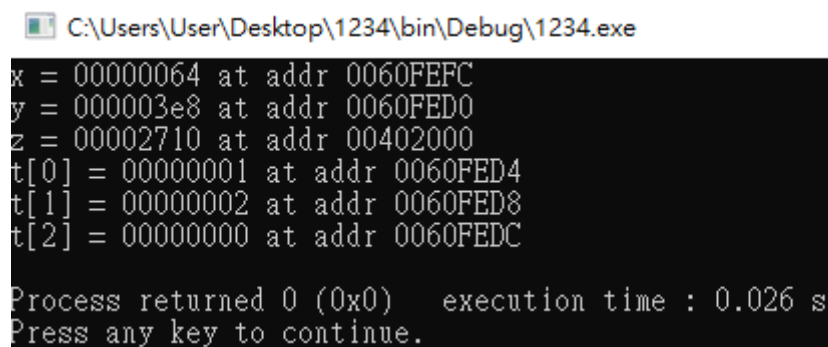
- second test program

```
#include <stdio.h>

int z = 10000;

int main()
{
    int x = 100, t[10] = {1,2}, y = 1000;
    printf("x = %08x at addr %p\n", x, &x);
    printf("y = %08x at addr %p\n", y, &y);
    printf("z = %08x at addr %p\n", z, &z);
    printf("t[0] = %08x at addr %p\n", t[0], &t[0]);
    printf("t[1] = %08x at addr %p\n", t[1], &t[1]);
    printf("t[2] = %08x at addr %p\n", t[2], &t[2]);
    return 0;
}
```

- the result is like the following :



```
x = 00000064 at addr 0060FEFC
y = 000003e8 at addr 0060FED0
z = 00002710 at addr 00402000
t[0] = 00000001 at addr 0060FED4
t[1] = 00000002 at addr 0060FED8
t[2] = 00000000 at addr 0060FEDC

Process returned 0 (0x0)   execution time : 0.026 s
Press any key to continue.
```

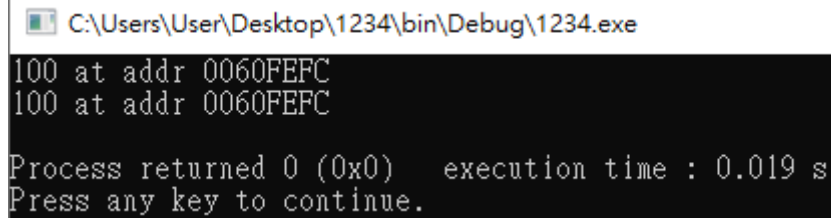
Value in an address

- program

```
#include <stdio.h>

int main()
{
    int n = 100;
    printf("%d at addr %p\n", n, &n);
    printf("%d at addr %p\n", *(&n), &n);
    return 0;
}
```

- the result is like the following :



```
C:\Users\User\Desktop\1234\bin\Debug\1234.exe
100 at addr 0060FEFC
100 at addr 0060FEFC
Process returned 0 (0x0)   execution time : 0.019 s
Press any key to continue.
```

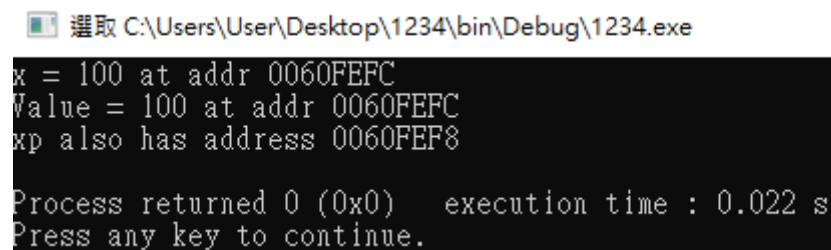
Usage of pointer variable

- first test program

```
#include <stdio.h>

int main()
{
    int x = 100;
    int *xp = &x;
    printf("x = %d at addr %p\n", x, xp);
    printf("Value = %d at addr %p\n", *xp, xp);
    printf("xp also has address %p\n", &xp);
    return 0;
}
```

- the result is like the following :




```
選択 C:\Users\User\Desktop\1234\bin\Debug\1234.exe
x = 100 at addr 0060FEFC
Value = 100 at addr 0060FEFC
xp also has address 0060FEF8
Process returned 0 (0x0)   execution time : 0.022 s
Press any key to continue.
```

- second test program

```
#include <stdio.h>

int main()
{
    int x = 100;
    int *xp = &x;
    *xp = 200;
    printf("x = %d at addr %p\n", x, &x);
    printf("x = %d at addr %p\n", *xp, xp);
    return 0;
}
```

- the result is like the following :

 C:\Users\User\Desktop\1234\bin\Debug\1234.exe

```
x = 200 at addr 0060FEF8
x = 200 at addr 0060FEF8


Process returned 0 (0x0)   execution time : 0.032 s
Press any key to continue.
```

- third test program

```
#include <stdio.h>

int main()
{
    int x = 100;
    printf("x = %d at addr %p\n", x, &x);
    int *xp = &x;
    int *zp = xp;
    *zp = 200;
    printf("x = %d at addr %p\n", x, &x);
    printf("x = %d at addr %p\n", *zp, zp);
    return 0;
}
```

- the result is like the following :

 選択 C:\Users\User\Desktop\1234\bin\Debug\1234.exe

```
x = 100 at addr 0060FEF4
x = 200 at addr 0060FEF4
x = 200 at addr 0060FEF4

Process returned 0 (0x0)   execution time : 0.032 s
Press any key to continue.
```

Practice 1 xA yB

- Program

```
#include <stdio.h>
#include <stdlib.h>
#include <time.h>

void getAB(int guess, int answer, int *x, int *y) {
    int cntA = 0, cntB = 0;
    int num[10] = {0};
    int guesscopy = guess;

    // 計算 cntA 和 num 陣列
    for (int i = 0; i < 4; i++) {
        int g = guess % 10;
        int a = answer % 10;
        guess /= 10;
        answer /= 10;
    }
}
```

```

        if (g == a) {
            cntA++;
        } else {
            num[a]++;
        }
    }

    // 計算 cntB 陣列
    for (int i = 0; i < 4; i++) {
        int g = guesscopy % 10;
        guesscopy /= 10;
        if (num[g] > 0) {
            cntB++;
            num[g]--;
        }
    }

    *x = cntA;
    *y = cntB;
}

void shuffleArray(int arr[], int size) {
    srand(time(NULL));

    for (int i = size - 1; i > 0; i--) {
        int j = rand() % (i + 1);
        int temp = arr[i];
        arr[i] = arr[j];
        arr[j] = temp;
    }
}

int main() {
    int a=1;
    printf("幾A幾B遊戲開始\n");

    // 產生不重複的隨機答案
    int digits[] = {0, 1, 2, 3, 4, 5, 6, 7, 8, 9};
    shuffleArray(digits, 10);
    int answer = 0;
    for (int i = 0; i < 4; i++) {
        answer = answer * 10 + digits[i];
    }

    printf("請猜測4個數字答案\n");
    int guess;
    scanf("%d", &guess);
    int x, y;

    while (1) {
        getAB(guess, answer, &x, &y);
        printf("%dA%dB\n", x, y);

        if (answer == guess) {
            break;
        }
    }
}

```

```

        printf("答案錯誤再猜一次\n");
        scanf("%d", &guess);
        a++;
    }

    printf("答案正確 · 共猜%d次\n", a++);
    return 0;
}

```

...

- the result is like the following :

```

幾A幾B遊戲開始
請猜測4個數字答案
1234
0A1B
答案錯誤再猜一次
5678
1A2B
答案錯誤再猜一次
3456
0A1B
答案錯誤再猜一次
1587
1A3B
答案錯誤再猜一次
7815
0A4B
答案錯誤再猜一次
8571
4A0B
答案正確 · 共猜6次

Process returned 0 (0x0)   execution time : 253.836 s
Press any key to continue.

```

Practice 2

- Program a to e

```

#include <stdio.h>

int main() {
    int a[10];

    printf("a: %p\n", a);
    printf("&a: %p\n", &a);
    printf("&a[0]: %p\n", &a[0]);
    printf("&a[3]: %p\n", &a[3]);
    printf("a + 3: %p\n", a + 3);
}

```

```

    for (int i = 0; i < 10; i++) {
        scanf("%d", a + i);
    }

    return 0;
}

```

- the results a to e are like the following :

```

a: 000000000061FDF0
&a: 000000000061FDF0
&a[0]: 000000000061FDF0
&a[3]: 000000000061FDFC
a + 3: 000000000061FDFC

Process returned 0 (0x0)    execution time : 0.045 s
Press any key to continue.

```

- the results f are like the following :
a + i作為變量地址，**i**從**0**到**9**遞增，表示要讀取的位置，輸入的整數將存儲在陣列的相應位置上。

Practice 3

- Program a to c

```

#include <stdio.h>

int main() {
    int a[10] = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10};
    int *ap = a;
    // a
    printf("ap[0] 的值為 : %d\n", ap[0]);
    // b
    for (int i = 0; i < 10; i++){
        printf("a[i] 的值為 : %d ap[i] 的值為 : %d, 相同\n", a[i], ap[i]);
    }
    // c
    for (int i = 0; i < 10; i++) {
        printf("(a+i) 索引值為 : %p *(a+i) 索引值為 : %p, 相同\n", *(a+i), *(ap+i));
    }
    return 0;
}

```


- o the results a to c are like the following :

```
ap[0] 的值为 : 1
a[i] 的值为 : 1 ap[i] 的值为 : 1, 相同
a[i] 的值为 : 2 ap[i] 的值为 : 2, 相同
a[i] 的值为 : 3 ap[i] 的值为 : 3, 相同
a[i] 的值为 : 4 ap[i] 的值为 : 4, 相同
a[i] 的值为 : 5 ap[i] 的值为 : 5, 相同
a[i] 的值为 : 6 ap[i] 的值为 : 6, 相同
a[i] 的值为 : 7 ap[i] 的值为 : 7, 相同
a[i] 的值为 : 8 ap[i] 的值为 : 8, 相同
a[i] 的值为 : 9 ap[i] 的值为 : 9, 相同
a[i] 的值为 : 10 ap[i] 的值为 : 10, 相同
*(a+i) 索引值为 : 0000000000000001 *(ap+i) 索引值为 : 0000000000000001, 相同
*(a+i) 索引值为 : 0000000000000002 *(ap+i) 索引值为 : 0000000000000002, 相同
*(a+i) 索引值为 : 0000000000000003 *(ap+i) 索引值为 : 0000000000000003, 相同
*(a+i) 索引值为 : 0000000000000004 *(ap+i) 索引值为 : 0000000000000004, 相同
*(a+i) 索引值为 : 0000000000000005 *(ap+i) 索引值为 : 0000000000000005, 相同
*(a+i) 索引值为 : 0000000000000006 *(ap+i) 索引值为 : 0000000000000006, 相同
*(a+i) 索引值为 : 0000000000000007 *(ap+i) 索引值为 : 0000000000000007, 相同
*(a+i) 索引值为 : 0000000000000008 *(ap+i) 索引值为 : 0000000000000008, 相同
*(a+i) 索引值为 : 0000000000000009 *(ap+i) 索引值为 : 0000000000000009, 相同
*(a+i) 索引值为 : 000000000000000A *(ap+i) 索引值为 : 000000000000000A, 相同

Process returned 0 (0x0)   execution time : 0.042 s
Press any key to continue.
```

- o Program d

```
#include <stdio.h>

int main() {
    int a[10] = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10};
    int *ap = a;
    a++;
    printf("%p\n", a++)
    return 0;
}
```

- the result d is like the following :

```

1  #include <stdio.h>
2
3  int main() {
4      int a[10] = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10};
5      int *ap = a;
6      a++;
7      printf("%p\n", a++);
8      return 0;
9  }
10

```

main.c x

Logs & others

Code::Blocks x Search results x Cccc x Build log x Build messages x

File	Line	Message
== Build: Debug in 123 (compiler: GNU GCC Compiler) ==		
In function 'main':		
C:\Users\us...	6	error: lvalue required as increment operand
C:\Users\us...	7	error: lvalue required as increment operand
C:\Users\us...	5	warning: unused variable 'ap' [-Wunused-variable]
== Build failed: 2 error(s), 1 warning(s) (0 minute(s), 0 second(s)) ==		

- Program e

```

#include <stdio.h>

int main() {
    int a[10] = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10};
    int *ap = a;
    ap++;
    printf("%p\n", ap++);
    return 0;
}

```

- the result e is like the following :

```

000000000061FDF4

Process returned 0 (0x0)   execution time : 0.017 s
Press any key to continue.

```

- Program f

```
#include <stdio.h>

int main() {
    int a[10] = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10};
    int *ap = a;
    printf("%p\n", ap);
    ap++;
    printf("%p\n", ap);
    return 0;
}
```

- the result f is like the following :

ap += k 的意義是將 ap 的指標向後移動(4bytes) k 個元素的位置。

```
000000000061FDF0
000000000061FDF4

Process returned 0 (0x0)    execution time : 0.039 s
Press any key to continue.
```

- Program g

```
#include <stdio.h>

int main() {
    int a[10] = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10};
    int *ap = a;
    printf("%p\n", ap);
    ap++;
    printf("%ld\n", ap-a);
    return 0;
}
```

- the result g is like the following :

```
000000000061FDF0
1

Process returned 0 (0x0)    execution time : 0.034 s
Press any key to continue.
```

Practice 4

- Program

```
#include <stdio.h>

int main() {
    int a[10];
    printf("sizeof(a): %ld\n", sizeof(a));
    printf("sizeof(a[0]): %ld\n", sizeof(a[0]));
    printf("sizeof(a) / sizeof(a[0]): %ld\n", sizeof(a) / sizeof(a[0]));
    return 0;
}
```

- the result is like the following :

```
sizeof(a): 40
sizeof(a[0]): 4
sizeof(a) / sizeof(a[0]): 10

Process returned 0 (0x0)    execution time : 0.041 s
Press any key to continue.
```

5/9 Pointer 2

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Function Pointer example

qsort

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Use ChatGPT to write code

Homework

5/30 專案&File I/O

專案修改部分(showAlreadyHiredPositionsByName)

File I/O note

Homework

6/6 Bash + Git

Bash + Git note

購票系統主頁面

購票系統標頭檔

購買一張門票(Function 2)

退回一張門票(Function 3)

呈現已購買之位置及人名(Function 4)

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專題之結論心得

結論&心得

- URL : https://hackmd.io/@Gr_p1-7DR8e3VBcMXbAVwg/BkTi0b6Nh

Note

- score is constant , you cannot change it.

```
#include <stdio.h>
#include <stdlib.h>

int main()
{
    int x, score[7];
    score = &x;
    return 0;
}
```

- the result is like the following :

File	Line	Message
		== Build: Debug in asd (compiler: GNU GCC Compiler) ==
C:\Users\us...		In function 'main':
C:\Users\us...	7	error: assignment to expression with array type
C:\Users\us...	6	warning: variable 'score' set but not used [-Wunused-but-set-variable]
		== Build failed: 1 error(s), 1 warning(s) (0 minute(s), 0 second(s)) ==

- point to next element

```
#include <stdio.h>
#include <stdlib.h>

int main()
{
    int score[7];
    int *sp = score;
    printf("score = %p\n", score);
    printf("sp = %p\n", sp);
    sp++;
    printf("sp = %p\n", sp);
    return 0;
}
```

- the result is like the following :

```
score = 000000000061FDF0
sp = 000000000061FDF0
sp = 000000000061FDF4

Process returned 0 (0x0)   execution time : 0.039 s
Press any key to continue.
|
```

- array and point 1

```
#include <stdio.h>
#include <stdlib.h>

int main()
{
    int score[7];
    for (int i=0; i<7; i++) scanf("%d", score+i);
    for (int i=0; i<7; i++) printf("%d ", score[i]);
    return 0;
}
```

- the result is like the following :

```
1 2 3 4 5 6 7
1 2 3 4 5 6 7
Process returned 0 (0x0)    execution time : 8.455 s
Press any key to continue.
```

- array and point 2

```
#include <stdio.h>
#include <stdlib.h>

int main()
{
    int score[7];
    for (int *sp = score; sp<score+7; sp++) scanf("%d", sp);
    for (int i=0; i<7; i++) printf("%d ", score[i]);
    return 0;
}
```

- the result is like the following :

```
7 6 5 4 3 2 1
7 6 5 4 3 2 1
Process returned 0 (0x0)    execution time : 7.149 s
Press any key to continue.
```

- array and point 3

```
#include <stdio.h>
#include <stdlib.h>

int main()
{
    int score[7];
    for (int *sp = score; sp<score+7; sp++) scanf("%d", sp);
    for (int *sp = score; sp<score+7;) printf("%d ", *sp++);
    return 0;
}
```

- the result is like the following :

```
1 3 5 7 9 11 13
1 3 5 7 9 11 13
Process returned 0 (0x0)    execution time : 9.584 s
Press any key to continue.
```

- string length

```
#include <stdio.h>
#include <stdlib.h>

int mystrlen(char *sp);

int main()
{
    char s[] = "Hello";
    printf("LEN = %d", mystrlen(s));
    return 0;
}

int mystrlen(char *sp)
{
    char *se = sp;
    while (*se) se++;
    return se-sp;
}
```

- the result is like the following :

```
LEN = 5
Process returned 0 (0x0)    execution time : 0.033 s
Press any key to continue.
```

- string copy

```
#include <stdio.h>
#include <stdlib.h>

void mystrcpy(char *dst, char *from);

int main()
{
    char s[] = "Hello";
    char ts[10];
    mystrcpy(ts, s);
    printf("ts = %s", ts);
    return 0;
}

void mystrcpy(char *dst, char *from)
{
    for (; (*dst = *from) ;dst++, from++) ;
}
```

- the result is like the following :

```
ts = Hello
Process returned 0 (0x0)    execution time : 0.036 s
Press any key to continue.
```

- string reverse

```
#include <stdio.h>
#include <stdlib.h>

void mystrcpy(char *dst, char *from);
void mystrrev(char *sp);

int main()
{
    char s[] = "Hello";
    char ts[10];
    mystrcpy(ts, s);
    mystrrev(ts);
    printf("ts = %s", ts);
    return 0;
}

void mystrrev(char *sp)
{
    char *se = sp;
    while (*se) se++;
    se--;
    for (; sp < se; sp++, se--){
        char t = *sp;
        *sp = *se;
        *se = t;
    }
}

void mystrcpy(char *dst, char *from)
{
    for (; (*dst = *from); dst++, from++) ;
}
```

- the result is like the following :

```
ts = olleH
Process returned 0 (0x0)    execution time : 0.040 s
Press any key to continue.
```

Practice

- Program

```
```c=
#include <stdio.h>
#include <stdlib.h>
```



```

void stract(char *dst, char *src);

void stract(char *dst, char *src)
{
 char*sp=dst;
 while(*sp)sp++;
 for(;*sp=*src);sp++, src++);
}

int main()
{
 char a[100] = "Hello";
 char b[100] = "John";
 stract (a, ", ");
 stract (a, b);
 printf("%s", a);
}

...

```

- the result is like the following :

```

Hello, John
Process returned 0 (0x0) execution time : 0.032 s
Press any key to continue.

```

## 5/16 Function Pointer

---

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專題之結論心得

結論&心得

- URL : [https://hackmd.io/@Gr\\_p1-7DR8e3VBcMXbAVwg/HJRVTrDH2](https://hackmd.io/@Gr_p1-7DR8e3VBcMXbAVwg/HJRVTrDH2)

## Note

---

### Function Pointer example

---

- program

```
#include <stdio.h>
#include <stdlib.h>

int add(int x, int y) { return x+y; }
int sub(int x, int y) { return x-y; }

int main()
{
 int (*fp)(int, int);
 fp = add;
 printf("Add(5,3) = %d\n", (*fp)(5,3));
 printf("Add(5,3) = %d\n", fp(5,3));
 fp = sub;
 printf("Add(5,3) = %d\n", (*fp)(5,3));
 printf("Add(5,3) = %d\n", fp(5,3));
 return 0;
}
```

- the result is like the following :

```
Add(5,3) = 8
Add(5,3) = 8
Add(5,3) = 2
Add(5,3) = 2

Process returned 0 (0x0) execution time : 0.014 s
Press any key to continue.
```

# qsort

---

- program

```
#include <stdio.h>
#include <stdlib.h>
#define N 10

int compare(const void *x, const void *y)
{
 int *xx = (int *)x;
 int *yy = (int *)y;
 return *xx - *yy;
}

int main()
{
 int a[N];
 for (int i=0;i<N;i++) a[i] = rand();
 qsort(a, N,sizeof(int), compare);
 for (int i=0; i<N;i++) printf("%d ", a[i]);
 return 0;
}
```

- the result is like the following :

```
41 6334 11478 15724 18467 19169 24464 26500 26962 29358
Process returned 0 (0x0) execution time : 0.018 s
Press any key to continue.
```

## Homework 1

---

- 1. Sort from small to large

```
#include <stdio.h>
#include <stdlib.h>
#define N 10

int compare(const void *x, const void *y)
{
 int *xx = (int *)x;
 int *yy = (int *)y;
 return *xx - *yy;
}

int main()
{
 int a[N];
 for (int i=0;i<N;i++) a[i] = rand();
 qsort(a, N,sizeof(int), compare);
 for (int i=0; i<N;i++) printf("%d ", a[i]);
 return 0;
}
```

- the result is like the following :

```
41 6334 11478 15724 18467 19169 24464 26500 26962 29358
Process returned 0 (0x0) execution time : 0.013 s
Press any key to continue.
```

- 2. Sort from large to small

```
#include <stdio.h>
#include <stdlib.h>
#define N 10

int compare(const void *x, const void *y)
{
 int *xx = (int *)x;
 int *yy = (int *)y;
 return *yy - *xx;
}

int main()
{
 int a[N];
 for (int i=0;i<N;i++) a[i] = rand();
 qsort(a, N,sizeof(int), compare);
 for (int i=0; i<N;i++) printf("%d ", a[i]);
 return 0;
}
```

- the result is like the following :

```
29358 26962 26500 24464 19169 18467 15724 11478 6334 41
Process returned 0 (0x0) execution time : 0.019 s
Press any key to continue.
```

- 3. Odd number first, then even number; from small to large

```
#include <stdio.h>
#include <stdlib.h>
#define N 10

int compare(const void *x, const void *y)
{
 int *xx = (int *)x;
 int *yy = (int *)y;
 if ((*xx % 2 == 0) && (*yy % 2 != 0))
 return 1;
 else if ((*xx % 2 != 0) && (*yy % 2 == 0))
 return -1;
 else
 return *xx - *yy;
}
```

```

int main()
{
 int a[N];
 for (int i = 0; i < N; i++)
 a[i] = rand();
 qsort(a, N, sizeof(int), compare);
 for (int i = 0; i < N; i++)
 printf("%d ", a[i]);
 return 0;
}

```

- the result is like the following :

```

41 18467 19169 6334 11478 15724 24464 26500 26962 29358
Process returned 0 (0x0) execution time : 0.016 s
Press any key to continue.

```

## Homework 2

- program

```

#include <stdio.h>

void menu1()
{
 printf("Show list of positions to be hired\n");
}

void menu2()
{
 printf("Show list of already hired positions\n");
}

void menu3()
{
 printf("Show list of already hired positions\n");
}

void menu4()
{
 printf("Hire a person\n");
}

void menu5()
{
 printf("Fire a person\n");
}

int main()
{
 void(*fp[5])() = {menu1, menu2, menu3, menu4, menu5};
 int n;
 do {
 printf("Which menu to execute? (1-5, 0:exit) : ");
 scanf("%d", &n);
 } while (n < 0 || n > 5);
 (*fp[n-1])();
}

```

```

 if (n <= 0 || n > 5)
 break;
 (*fp[n-1])();
 } while (1);
return 0;
}

```

- the result is like the following :

```

Which menu to execute? (1-5, 0:exit) : 1
Show list of positions to be hired
Which menu to execute? (1-5, 0:exit) : 2
Show list of already hired positions
Which menu to execute? (1-5, 0:exit) : 3
Show list of already hired positions
Which menu to execute? (1-5, 0:exit) : 4
Hire a person
Which menu to execute? (1-5, 0:exit) : 5
Fire a person
Which menu to execute? (1-5, 0:exit) : 0

Process returned 0 (0x0) execution time : 7.247 s
Press any key to continue.

```

## 5/23 A I + 專案

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    結論&心得

- URL : [https://hackmd.io/@Gr\\_p1-7DR8e3VBcMXbAVwg/rJuigsYSn](https://hackmd.io/@Gr_p1-7DR8e3VBcMXbAVwg/rJuigsYSn)

## Note

### Use ChatGPT to write code

:::info

My Prompt

:::

1. Choose a function, enter 0 to finish:

- 1) Show list of positions to be hired // Show numbers in a row
- 2) Show list of already hired positions (Sort by number)
- 3) Show list of already hired positions (Sort by name)
- 4) Hire a person// Input number and name to set a position
- 5) Fire a person// Input number to fire a person

2. 建立一個人員結構陣列,包括以下欄位:

- 編號:整數(1...10)
- 是否已招募 :0= 未招募;1=已招募
- 姓名:80 個字元的陣列,存放招募人員姓名

3. 建立一個全域變數 **Group**,共有10個元素,每個元素都是一個人員結構。

4. 對 **Group** 內的元素進行初始設定,其中人員編號為一到十,全部的人員都還沒有招募,姓名都是空字串。

請根據以上的要求請幫我撰寫相關的C程式碼

:::danger

ChatGPT output

:::

```
#include <stdio.h>
#include <string.h>

#define MAX_NAME_LENGTH 80
#define GROUP_SIZE 10
```

```

typedef struct {
 int number;
 int hired;
 char name[MAX_NAME_LENGTH];
} Person;

// Function declarations
void showMenu();
void showListOfPositions(Person group[]);
void showListOfHiredPositionsByNumber(Person group[]);
void showListOfHiredPositionsByName(Person group[]);
void hirePerson(Person group[]);
void firePerson(Person group[]);

Person group[GROUP_SIZE];

int main() {
 int choice;

 // Initialize the group
 for (int i = 0; i < GROUP_SIZE; i++) {
 group[i].number = i + 1;
 group[i].hired = 0;
 strcpy(group[i].name, "");
 }

 do {
 showMenu();
 scanf("%d", &choice);

 switch (choice) {
 case 1:
 showListOfPositions(group);
 break;
 case 2:
 showListOfHiredPositionsByNumber(group);
 break;
 case 3:
 showListOfHiredPositionsByName(group);
 break;
 case 4:
 hirePerson(group);
 break;
 case 5:
 firePerson(group);
 break;
 default:
 if (choice != 0) {
 printf("Invalid choice. Please try again.\n");
 }
 }

 printf("\n");
 } while (choice != 0);

 return 0;
}

```



```

}

void showMenu() {
 printf("Choose a function, enter 0 to finish:\n");
 printf("1) Show list of positions to be hired\n");
 printf("2) Show list of already hired positions (Sort by number)\n");
 printf("3) Show list of already hired positions (Sort by name)\n");
 printf("4) Hire a person\n");
 printf("5) Fire a person\n");
 printf("Choice: ");
}

void showListOfPositions(Person group[]) {
 printf("List of positions to be hired:\n");
 for (int i = 0; i < GROUP_SIZE; i++) {
 if (group[i].hired == 0) {
 printf("%d) Position %d\n", i + 1, group[i].number);
 }
 }
}

void showListOfHiredPositionsByNumber(Person group[]) {
 printf("List of already hired positions (Sort by number):\n");
 for (int i = 0; i < GROUP_SIZE; i++) {
 if (group[i].hired == 1) {
 printf("Position %d: %s\n", group[i].number, group[i].name);
 }
 }
}

void showListOfHiredPositionsByName(Person group[]) {
 printf("List of already hired positions (Sort by name):\n");
 for (int i = 0; i < GROUP_SIZE; i++) {
 if (group[i].hired == 1) {
 printf("Position %d: %s\n", group[i].number, group[i].name);
 }
 }
}

void hirePerson(Person group[]) {
 int position;

 printf("Enter the position number to hire a person: ");
 scanf("%d", &position);

 if (position < 1 || position > GROUP_SIZE) {
 printf("Invalid position number. Please try again.\n");
 return;
 }

 if (group[position - 1].hired == 1) {
 printf("Position %d is already hired.\n", position);
 } else {
 group[position - 1].hired = 1;
 printf("Enter the name for position %d: ", position);
 scanf("%s", group[position - 1].name);
 }
}

```

```

 printf("Person hired for position %d.\n", position);
 }
}

void firePerson(Person group[]) {
 int position;

 printf("Enter the position number to fire a person: ");
 scanf("%d", &position);

 if (position < 1 || position > GROUP_SIZE) {
 printf("Invalid position number. Please try again.\n");
 return;
 }

 if (group[position - 1].hired == 0) {
 printf("Position %d is not hired.\n", position);
 } else {
 group[position - 1].hired = 0;
 strcpy(group[position - 1].name, "");
 printf("Person fired from position %d.\n", position);
 }
}
}

```

- 測試結果：程式碼合理且一切正常，還可依照使用者的需求增強它的功能。

## Homework

- the following is workspace
- code successfully executed



- main.c

```

#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include "myheader.h"

```

```

Person Group[NUM_PERSONS];

```

```

void showMenu()
{
 printf("Choose a function, enter 0 to finish:\n");
 printf("1) Show list of positions to be hired\n");
 printf("2) Show list of already hired positions (Sort by number)\n");
 printf("3) Show list of already hired positions (Sort by name)\n");
 printf("4) Hire a person\n");
 printf("5) Fire a person\n");
}

int main()
{
 for (int i = 0; i < NUM_PERSONS; i++) {
 Group[i].id = i + 1;
 Group[i].hired = 0;
 strcpy(Group[i].name, "");
 }

 int choice;
 do {
 showMenu();
 scanf("%d", &choice);

 switch (choice) {
 case 0:
 printf("Exiting...\n");
 break;
 case 1:
 showPositionsToBeHired(Group);
 break;
 case 2:
 showAlreadyHiredPositionsByNumber(Group);
 break;
 case 3:
 showAlreadyHiredPositionsByName(Group);
 break;
 case 4:
 hirePerson(Group);
 break;
 case 5:
 firePerson(Group);
 break;
 default:
 printf("Invalid choice. Please try again.\n\n");
 break;
 }
 } while (choice != 0);

 return 0;
}

```

- myheader.h

```

#ifndef MYHEADER_H_INCLUDED
#define MYHEADER_H_INCLUDED

```

```

#define NUM_PERSONS 10
#define MAX_NAME_LENGTH 80

typedef struct {
 int id;
 int hired;
 char name[MAX_NAME_LENGTH];
} Person;

void showPositionsToBeHired(Person group[]);
void showAlreadyHiredPositionsByNumber(Person group[]);
void showAlreadyHiredPositionsByName(Person group[]);
void hirePerson(Person group[]);
void firePerson(Person group[]);

#endif // MYHEADER_H_INCLUDED

```

- showAlreadyHiredPositionsByName.h

```

#include <stdio.h>
#include "myheader.h"

void showAlreadyHiredPositionsByName(Person group[])
{
 printf("Already hired positions (Sorted by name):\n");
 for (int i = 0; i < NUM_PERSONS; i++) {
 if (group[i].hired) {
 printf("%s\n", group[i].name);
 }
 }
 printf("\n");
}

```

- showAlreadyHiredPositionsByNumber.h

```

#include <stdio.h>
#include "myheader.h"

void showAlreadyHiredPositionsByNumber(Person group[])
{
 printf("Already hired positions (Sorted by number):\n");
 for (int i = 0; i < NUM_PERSONS; i++) {
 if (group[i].hired) {
 printf("%d\n", group[i].id);
 }
 }
 printf("\n");
}

```

- showPositionsToBeHired.h

```

#include <stdio.h>
#include "myheader.h"

void showPositionsToBeHired(Person group[])
{
 printf("Positions to be hired:\n");
 for (int i = 0; i < NUM_PERSONS; i++) {
 if (!group[i].hired) {
 printf("%d\n", group[i].id);
 }
 }
 printf("\n");
}

```

- hirePerson.h

```

#include <stdio.h>
#include "myheader.h"

void hirePerson(Person group[])
{
 int position;
 char name[MAX_NAME_LENGTH];

 printf("Enter the position number to hire: ");
 scanf("%d", &position);

 if (position < 1 || position > NUM_PERSONS) {
 printf("Invalid position number.\n\n");
 return;
 }

 if (group[position - 1].hired) {
 printf("Position is already hired.\n\n");
 return;
 }

 printf("Enter the name of the person to hire: ");
 scanf("%s", name);

 group[position - 1].id = position;
 group[position - 1].hired = 1;
 strcpy(group[position - 1].name, name);

 printf("Person hired successfully.\n\n");
}

```

- firePerson.h

```

#include <stdio.h>
#include <string.h>
#include "myheader.h"

```

```

void firePerson(Person group[])
{
 int position;

 printf("Enter the position number to fire: ");
 scanf("%d", &position);

 if (position < 1 || position > NUM_PERSONS) {
 printf("Invalid position number.\n\n");
 return;
 }

 if (!group[position - 1].hired) {
 printf("Position is not hired.\n\n");
 return;
 }

 group[position - 1].hired = 0;
 strcpy(group[position - 1].name, "");

 printf("Person fired successfully.\n\n");
}

```

## 5/30 專案&File I/O

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- URL : [https://hackmd.io/@Gr\\_p1-7DR8e3VBcMXbAVwg/H1eAr2g8n](https://hackmd.io/@Gr_p1-7DR8e3VBcMXbAVwg/H1eAr2g8n)

## 專案修改部分(showAlreadyHiredPositionsByName)

```
#include <stdio.h>
#include "myheader.h"
#include <string.h>
#include <stdlib.h>

typedef struct {
 char name[MAX_NAME_LENGTH];
 int position;
} HiredPerson;

int compareNames(const void* a, const void* b);

void showAlreadyHiredPositionsByName(Person group[])
{
 printf("Already hired positions (Sorted by name):\n");
 HiredPerson hiredPersons[NUM_PERSONS];
 int numPersons = 0;
 for (int i = 0; i < NUM_PERSONS; i++) {
 if (group[i].hired) {
 strcpy(hiredPersons[numPersons].name, group[i].name);
 hiredPersons[numPersons].position = i + 1;
 numPersons++;
 }
 }
 qsort(hiredPersons, numPersons, sizeof(HiredPerson), compareNames);
 for (int i = 0; i < numPersons; i++) {
 printf("%d %s\n", hiredPersons[i].position, hiredPersons[i].name);
 }
 printf("\n");
}

int compareNames(const void* a, const void* b)
{
 const HiredPerson* person1 = (const HiredPerson*)a;
 const HiredPerson* person2 = (const HiredPerson*)b;
 return strcmp(person1->name, person2->name);
}
```

- 程式碼定義了一個函式 compareNames，用於比較兩個 HiredPerson 結構體的名稱欄位
- 並使用 qsort 函式對 hiredPersons 陣列進行排序，使用 compareNames 函式進行比較。

# File I/O note

- write to File Example

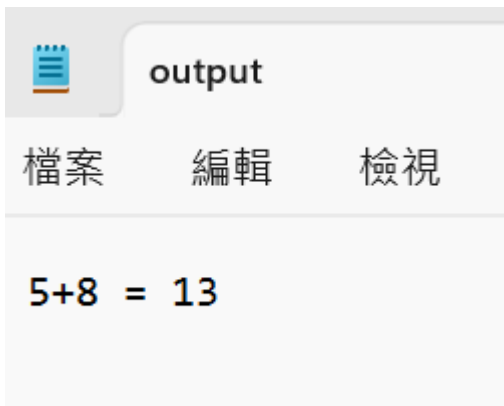
```
#include <stdio.h>
#include <stdlib.h>
int main()
{
 FILE *fp;
 if ((fp = fopen("output.txt", "w")) == NULL) {
 printf("Open File ERROR!\n");
 } else {
 int a, b;
 printf("Input a and b: ");
 scanf("%d %d", &a, &b);
 fprintf(fp, "%d %d = %d", a, b, a+b);
 fclose(fp);
 }
 return 0;
}
```

- the result is like the following :

Input a and b: 8 5

Process returned 0 (0x0) execution time : 2.827 s  
Press any key to continue.

- 沒有輸出是因為印到檔案：



- 讀取檔案

```
#include <stdio.h>
#include <stdlib.h>
int main()
{
 FILE *fp;
 if ((fp = fopen("output.txt", "r")) == NULL) {
 printf("Open File ERROR!\n");
 } else {
 char str[80];
 fgets(str, 80, fp);
 printf("%s", str);
 fclose(fp);
 }
}
```



```

 }
 return 0;
}

```

- the result is like the following :

```

8+5 = 13
Process returned 0 (0x0) execution time : 0.033 s
Press any key to continue.

```

- Bkinary Read Example 1

```

#include <stdio.h>
typedef struct pair { int x, y; } Pair;
int main()
{
 Pair p[2];
 FILE *fp;
 if ((fp=fopen("output.dat", "rb")) == NULL) { printf("File open
error!\n");
 } else {
 fread (p, sizeof (Pair), 2, fp);
 fclose (fp);
 printf("p[1] = (%d, %d) \n", p[1].x, p[1].y);
 }
 return 0;
}

```

- the result is like the following :

```

p[1] = (4, 6)

Process returned 0 (0x0) execution time : 0.038 s
Press any key to continue.

```

- Bkinary Read Example 2

```

#include <stdio.h>
typedef struct pair { int x, y; } Pair;
int main()
{
 Pair p2;
 FILE *fp;
 if ((fp=fopen("output.dat", "rb")) == NULL) { printf("File open
error!\n");
 } else {
 fseek(fp, sizeof(Pair), SEEK_SET);
 fread (&p2, sizeof (Pair), 1, fp);
 fclose (fp);
 printf("p2 = (%d, %d) \n", p2.x, p2.y);
 }
 return 0;
}

```

```
}
```

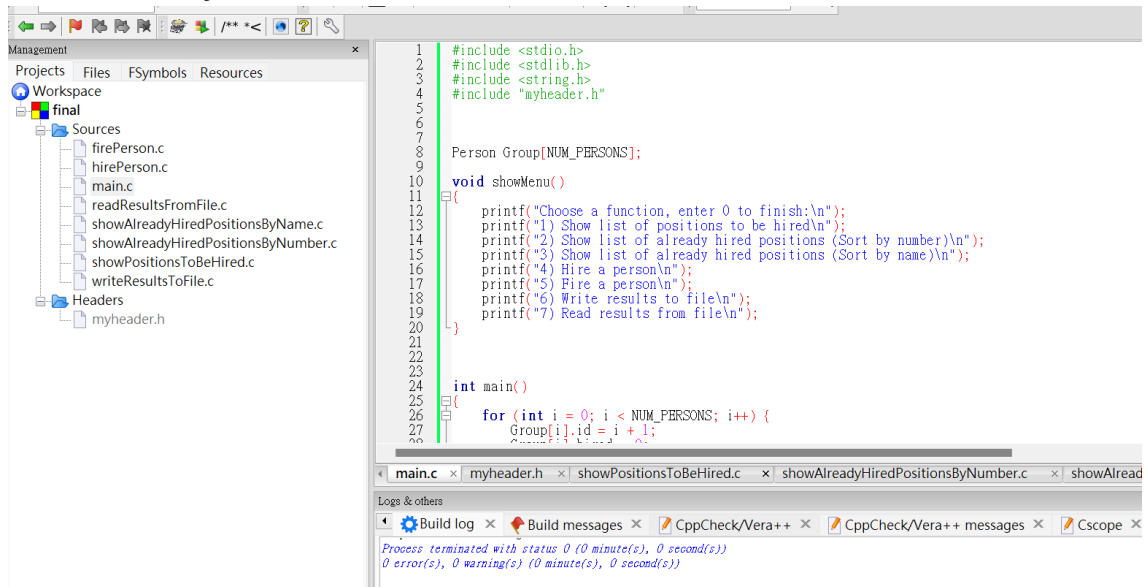
- the result is like the following :

```
p2 = (4, 6)
```

```
Process returned 0 (0x0) execution time : 0.030 s
Press any key to continue.
```

## Homework

- the following is workspace
- code successfully executed



:::info

以下是增加的選項，可將結果寫入檔案、讀出檔案

:::

- writeResultsToFile.c

```
#include <stdio.h>
#include "myheader.h"

void writeResultsToFile(Person group[])
{
 FILE *file;
 file = fopen(FILE_NAME, "w");
 if (file == NULL) {
 printf("Unable to open file.\n\n");
 return;
 }

 for (int i = 0; i < NUM_PERSONS; i++) {
 fprintf(file, "%d %d %s\n", group[i].id, group[i].hired,
group[i].name);
 }

 fclose(file);
}
```

```
 printf("Results written to file successfully.\n\n");
}
```

- readResultsFromFile.c

```
#include <stdio.h>
#include "myheader.h"
#include <string.h>
```

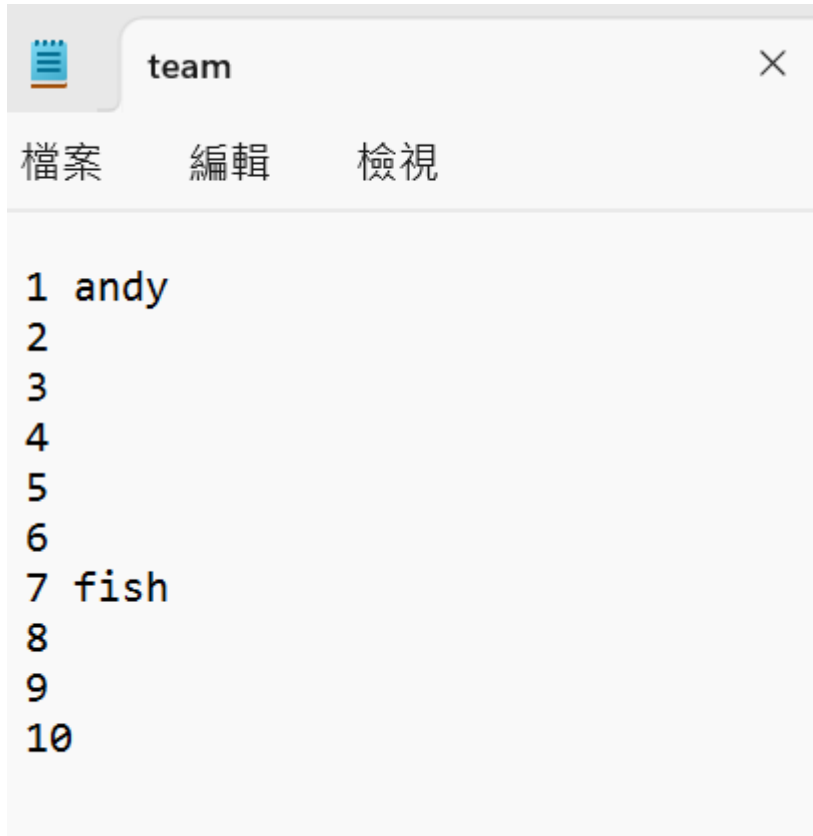
```
void readResultsFromFile(Person group[])
{
 FILE *file;
 file = fopen(FILE_NAME, "r");
 if (file == NULL) {
 printf("Unable to open file.\n\n");
 return;
 }

 char line[MAX_NAME_LENGTH + 10];
 int id;
 char name[MAX_NAME_LENGTH];

 for (int i = 0; i < NUM_PERSONS; i++) {
 if (fgets(line, sizeof(line), file) != NULL) {
 if (sscanf(line, "%d %[\n]", &id, name) == 2) {
 group[i].id = id;
 strcpy(group[i].name, name);
 printf("%d %s\n", group[i].id, group[i].name);
 }
 }
 }

 fclose(file);
 printf("Results read from file successfully.\n\n");
}
...
```

- 以下是執行結果



```
3) Show list of already hired positions (Sort by name)
4) Hire a person
5) Fire a person
6) Write results to file
7) Read results from file
6
Results written to file successfully.

Choose a function, enter 0 to finish:
1) Show list of positions to be hired
2) Show list of already hired positions (Sort by number)
3) Show list of already hired positions (Sort by name)
4) Hire a person
5) Fire a person
6) Write results to file
7) Read results from file
7
1 andy
7 fish
Results read from file successfully.
```

## 6/6 Bash + Git

[計算機概論期末報告](#)

[電機一乙 11128245 陳昱宇 期末報告](#)

[Weekly Learning Record](#)

[期末報告專案 演唱會購票系統](#)

[5/9 Pointer 2](#)

[Note](#)

[Practice](#)

[5/16 Function Pointer](#)

## Note

Function Pointer example

qsort

## Homework 1

## Homework 2

5/23 A I + 專案

Note

Use ChatGPT to write code

## Homework

5/30 專案&File I/O

專案修改部分(showAlreadyHiredPositionsByName)

File I/O note

## Homework

6/6 Bash + Git

Bash + Git note

購票系統主頁面

購票系統標頭檔

購買一張門票(Function 2)

退回一張門票(Function 3)

呈現已購買之位置及人名(Function 4)

呈現尚未購買之位置(Function 5)

寫入檔案(Function 6)

讀出檔案(Function 7)

位置售出狀況相對圖(Function 8)

單獨查詢座位之購票情形(Function 9)

呈現總購票數及剩餘票數(Function 10)

專題之結論心得

結論&心得

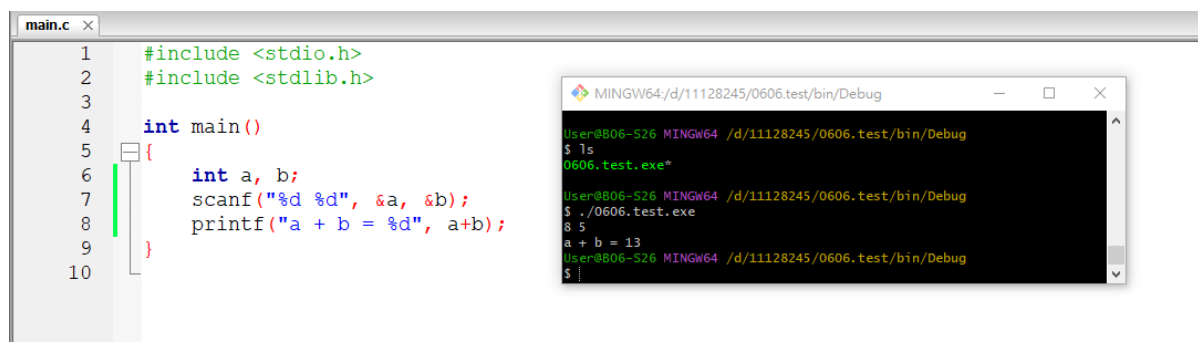
- URL : [https://hackmd.io/@Gr\\_p1-7DR8e3VBcMXbAVwg/rysas-283](https://hackmd.io/@Gr_p1-7DR8e3VBcMXbAVwg/rysas-283)

## Bash + Git note

:::info

test Bash

:::



## 購票系統主頁面

:::success

- 以下是main.c的主程式碼
- 用演唱會購票系統的主題做呈現

:::

```

#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include "myheader.h"

Person Group[NUM_PERSONS];

void showMenu()
{
 printf("\033[1;33m");
 printf("\033[44m");
 printf("Concert Ticket Booking Menu\033[0m\n");
 printf("\n");
 printf("\033[1;32m");
 printf("1) Important Information for Ticket Purchase\n");
 printf("2) Purchase a Ticket\n");
 printf("3) Return a Ticket\n");
 printf("4) Show Booked Positions\n");
 printf("5) Show Available Positions\n");
 printf("6) Write Results to File\n");
 printf("7) Read Results from File\n");
 printf("8) void showSeatLayout\n");
 printf("9) Search for a Ticket\n");
 printf("10) Ticket Statistics\n");
 printf("\033[0m");
 printf("\n");
 printf("Choose a function, enter 0 to finish:\n");
}

int main()
{
 for (int i = 0; i < NUM_PERSONS; i++) {
 Group[i].id = i + 1;
 Group[i].hired = 0;
 strcpy(Group[i].name, "");
 }

 int choice;
 do {
 showMenu();
 scanf("%d", &choice);

 switch (choice) {
 case 0:
 printf("\033[1;31m");
 printf("Exiting...\n");
 printf("\033[0m");
 break;
 case 1:
 showImportantInformation(Group);
 break;
 case 2:
 purchaseTicket(Group);
 break;
 case 3:

```

```

 returnTicket(Group);
 break;
 case 4:
 showBookedPositions(Group);
 break;
 case 5:
 showAvailablePositions(Group);
 break;
 case 6:
 writeResultsToFile(Group);
 break;
 case 7:
 readResultsFromFile(Group);
 break;
 case 8:
 showSeatLayout(Group);
 break;
 case 9:
 searchTicket(Group);
 break;
 case 10:
 ticketStatistics(Group);
 break;
 default:
 printf("\033[1;31m");
 printf("Invalid choice. Please try again.\n\n");
 printf("\033[0m");
 break;
 }
} while (choice != 0);
}

```

:::info

- 程式碼當中的showMenu用來顯示當前可使用的功能
- 使用 ANSI 轉義序列改變字體及背景色彩
- 主程式的部分可以不斷迴圈供使用者選取功能

:::

:::danger

主頁面呈現(如下圖)

...

## Concert Ticket Booking Menu

- 1) Important Information for Ticket Purchase
- 2) Purchase a Ticket
- 3) Return a Ticket
- 4) Show Booked Positions
- 5) Show Available Positions
- 6) Write Results to File
- 7) Read Results from File
- 8) void showSeatLayout
- 9) Search for a Ticket
- 10) Ticket Statistics

Choose a function, enter 0 to finish:

## 購票系統標頭檔

...success

- 以下是myheader.h的標頭檔

...

```
#ifndef MYHEADER_H_INCLUDED
#define MYHEADER_H_INCLUDED

#define MAX_NAME_LENGTH 80
#define NUM_PERSONS 50

typedef struct {
 int id;
 int hired;
 char name[MAX_NAME_LENGTH];
} Person;

void showImportantInformation(Person Group[]);
void purchaseTicket(Person Group[]);
void readResultsFromFile(Person Group[]);
void returnTicket(Person Group[]);
void showAvailablePositions(Person Group[]);
void showBookedPositions(Person Group[]);
void writeResultsToFile(Person Group[]);
void showSeatLayout(Person Group[]);
void searchTicket(Person Group[]);
void ticketStatistics(Person Group[]);

#endif // MYHEADER_H_INCLUDED
```



:::info

- 標頭檔它包含了常數、結構和函式原型的定義，這裡用來提供組織和管理代碼的方式。
- 函式原型則用來定義不同的操作，如顯示重要資訊、購買票、讀取和寫入結果等功能。

...

## 顯示購票之重要資訊(Function 1)

:::success

- 以下是showImportantInformation.c的程式碼

...

```
#include <stdio.h>
#include "myheader.h"

void showImportantInformation(Person Group[])
{
 printf("\033[1;34m");
 printf("Important Information for Ticket Purchase:\n");
 printf("\033[0m");
 printf("- Tickets are non-transferable and non-refundable.\n");
 printf("- Please bring your ID card and booking confirmation when attending the concert.\n");
 printf("- Entry to the concert will be granted only to those with valid tickets.\n\n");
 printf("\n");
}
```

:::info

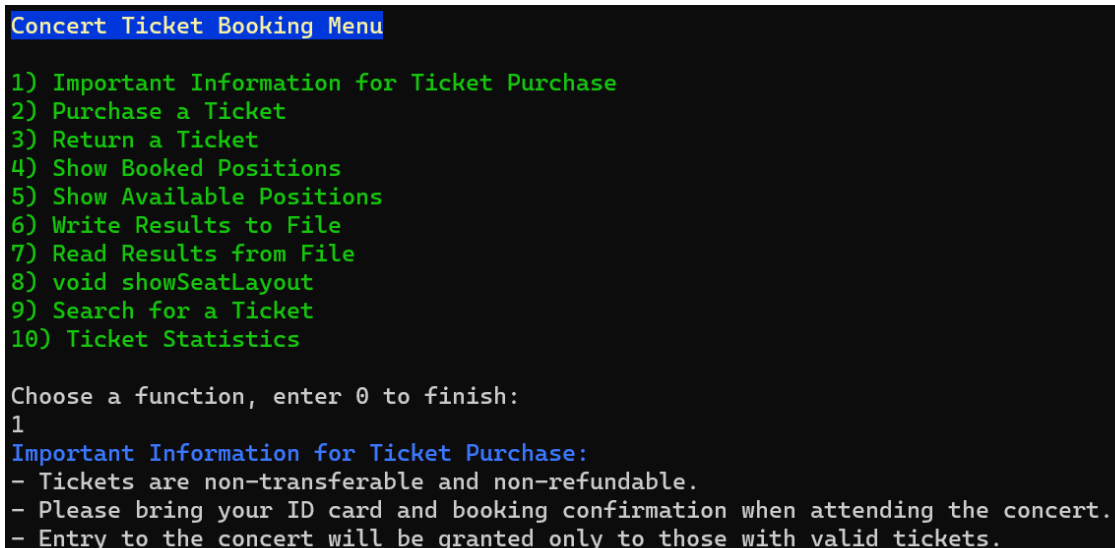
- 這段程式碼定義了一個名為 showImportantInformation 的函式
- 能在終端機上顯示重要的購票資訊給使用者閱讀。

...

:::danger

重要的購票資訊(如下圖)

...



```
Concert Ticket Booking Menu

1) Important Information for Ticket Purchase
2) Purchase a Ticket
3) Return a Ticket
4) Show Booked Positions
5) Show Available Positions
6) Write Results to File
7) Read Results from File
8) void showSeatLayout
9) Search for a Ticket
10) Ticket Statistics

Choose a function, enter 0 to finish:
1
Important Information for Ticket Purchase:
- Tickets are non-transferable and non-refundable.
- Please bring your ID card and booking confirmation when attending the concert.
- Entry to the concert will be granted only to those with valid tickets.
```

# 購買一張門票(Function 2)

:::success

- 以下是purchaseTicket.c的程式碼
- ...

```
#include <stdio.h>
#include <string.h>
#include "myheader.h"

void purchaseTicket(Person Group[])
{
 int position;
 char name[MAX_NAME_LENGTH];
 showSeatLayout(Group);
 printf("Enter the position number to book a ticket: ");
 scanf("%d", &position);

 if (position < 1 || position > NUM_PERSONS) {
 printf("\033[1;31m");
 printf("Invalid position number.\n\n");
 printf("\033[0m");
 return;
 }

 if (Group[position - 1].hired) {
 printf("\033[1;31m");
 printf("Position is already booked.\n\n");
 printf("\033[0m");
 return;
 }

 printf("Enter the name of the person booking the ticket: ");
 scanf("%s", name);

 Group[position - 1].id = position;
 Group[position - 1].hired = 1;
 strcpy(Group[position - 1].name, name);

 printf("\033[1;32m");
 printf("Ticket booked successfully.\n\n");
 printf("\033[0m");
}
```

:::info

- 這段程式碼定義了一個名為 purchaseTicket 的函式，使用者可以透過此函式購買門票
- 一開始函式會顯示尚未售出票的位置
- 使用者可以依自己喜好選擇想購買演唱會門票的位置

...

:::danger

如果購買成功會顯示Ticket booked successfully.(如下圖)

...

```
Concert Ticket Booking Menu

1) Important Information for Ticket Purchase
2) Purchase a Ticket
3) Return a Ticket
4) Show Booked Positions
5) Show Available Positions
6) Write Results to File
7) Read Results from File
8) void showSeatLayout
9) Search for a Ticket
10) Ticket Statistics

Choose a function, enter 0 to finish:
2
Seat Layout:
 1 2 3 4 5 6 7 8 9 10
11 12 13 14 15 16 17 18 19 20
21 22 23 24 25 26 27 28 29 30
31 32 33 34 35 36 37 38 39 40
41 42 43 44 45 46 47 48 49 50

Enter the position number to book a ticket: 10
Enter the name of the person booking the ticket: curry
Ticket booked successfully.
```

:::danger

重複位置則輸出：Position is already booked.(如下圖)

...

## Concert Ticket Booking Menu

- 1) Important Information for Ticket Purchase
- 2) Purchase a Ticket
- 3) Return a Ticket
- 4) Show Booked Positions
- 5) Show Available Positions
- 6) Write Results to File
- 7) Read Results from File
- 8) void showSeatLayout
- 9) Search for a Ticket
- 10) Ticket Statistics

Choose a function, enter 0 to finish:

2

Seat Layout:

1	2	3	4	5	6	7	8	9	
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50

Enter the position number to book a ticket: 10

Position is already booked.

...danger

如果是超出定義範圍的位置則輸出Invalid position number.(如下圖)

...

## Concert Ticket Booking Menu

- 1) Important Information for Ticket Purchase
- 2) Purchase a Ticket
- 3) Return a Ticket
- 4) Show Booked Positions
- 5) Show Available Positions
- 6) Write Results to File
- 7) Read Results from File
- 8) void showSeatLayout
- 9) Search for a Ticket
- 10) Ticket Statistics

Choose a function, enter 0 to finish:

2

Seat Layout:

1	2	3	4	5	6	7	8	9	
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50

Enter the position number to book a ticket: 100

Invalid position number.

## 退回一張門票(Function 3)

:::success

- 以下是returnTicket.c的程式碼

:::

```
#include <stdio.h>
#include "myheader.h"
#include <string.h>

void returnTicket(Person Group[])
{
 printf("Booked Tickets:\n");
 for (int i = 0; i < NUM_PERSONS; i++) {
 if (Group[i].hired) {
 printf("\033[1;31m");
 printf("Position %d: %s\n", Group[i].id, Group[i].name);
 printf("\033[0m");
 }
 }
 printf("\n");

 int position;
```

```

printf("Enter the position number to return the ticket: ");
scanf("%d", &position);

if (position < 1 || position > NUM_PERSONS) {
 printf("\033[1;31m");
 printf("Invalid position number.\n\n");
 printf("\033[0m");
 return;
}

if (!Group[position - 1].hired) {
 printf("\033[1;31m");
 printf("Position is not booked.\n\n");
 printf("\033[0m");
 return;
}

Group[position - 1].hired = 0;
strcpy(Group[position - 1].name, "");

printf("\033[1;32m");
printf("Ticket returned successfully.\n\n");
printf("\033[0m");
}

```

:::info

- 這段程式碼定義了一個名為 returnTicket 的函式，使用者可以透過此函式退回門票
- 一開始函式會顯示售出票的位置
- 使用者可以依自己喜好選擇想退回演唱會門票的位置

:::

:::danger

如果退票成功會顯示Ticket returned successfully.(如下圖)

...

## Concert Ticket Booking Menu

- 1) Important Information for Ticket Purchase
- 2) Purchase a Ticket
- 3) Return a Ticket
- 4) Show Booked Positions
- 5) Show Available Positions
- 6) Write Results to File
- 7) Read Results from File
- 8) void showSeatLayout
- 9) Search for a Ticket
- 10) Ticket Statistics

Choose a function, enter 0 to finish:

3

Booked Tickets:

Position 10: curry

Enter the position number to return the ticket: 10

Ticket returned successfully.

...danger

如果退票的位置尚未購買則會顯示Position is not booked.(如下圖)

...

## Concert Ticket Booking Menu

- 1) Important Information for Ticket Purchase
- 2) Purchase a Ticket
- 3) Return a Ticket
- 4) Show Booked Positions
- 5) Show Available Positions
- 6) Write Results to File
- 7) Read Results from File
- 8) void showSeatLayout
- 9) Search for a Ticket
- 10) Ticket Statistics

Choose a function, enter 0 to finish:

3

Booked Tickets:

Position 10: curry

Enter the position number to return the ticket: 1

Position is not booked.

:::danger

如果退票的位置超出設定範圍則會顯示Invalid position number.(如下圖)

:::

## Concert Ticket Booking Menu

```
1) Important Information for Ticket Purchase
2) Purchase a Ticket
3) Return a Ticket
4) Show Booked Positions
5) Show Available Positions
6) Write Results to File
7) Read Results from File
8) void showSeatLayout
9) Search for a Ticket
10) Ticket Statistics
```

Choose a function, enter 0 to finish:

3

Booked Tickets:

Position 10: curry

Enter the position number to return the ticket: 100

Invalid position number.

## 呈現已購買之位置及人名(Function 4)

:::success

- 以下是showBookedPositions.c的程式碼

:::

```
#include <stdio.h>
#include "myheader.h"

void showBookedPositions(Person Group[])
{
 printf("\033[1;34m");
 printf("Booked Positions:\n");
 printf("\033[0m");
 for (int i = 0; i < NUM_PERSONS; i++) {
 if (Group[i].hired) {
 printf("%d. %s\n", Group[i].id, Group[i].name);
 }
 }
 printf("\n");
}
```

:::info



- 這段程式碼定義了一個名為 showBookedPositions 的函式，使用者可以透過此函式看到已經購買的門票

...

\*\*\*danger

顯示已購票的位置及姓名(如下圖)

...

## Concert Ticket Booking Menu

```
1) Important Information for Ticket Purchase
2) Purchase a Ticket
3) Return a Ticket
4) Show Booked Positions
5) Show Available Positions
6) Write Results to File
7) Read Results from File
8) void showSeatLayout
9) Search for a Ticket
10) Ticket Statistics
```

Choose a function, enter 0 to finish:

4

Booked Positions:

10. curry

## 呈現尚未購買之位置(Function 5)

\*\*\*success

- 以下是showAvailablePositions.c的程式碼

...

```
#include <stdio.h>
#include "myheader.h"

#define NUM_POSITIONS_PER_ROW 10

void showAvailablePositions(Person Group[])
{
 printf("\033[1;34m");
 printf("Available Positions:\n");
 printf("\033[0m");

 int count = 0;
 for (int i = 0; i < NUM_PERSONS; i++) {
 if (!Group[i].hired) {
 printf("%2d ", Group[i].id);
 count++;
 if (count % NUM_POSITIONS_PER_ROW == 0) {
```

```

 printf("\n");
 }
}

printf("\n");
}

```

:::info

- 這段程式碼定義了一個名為 showAvailablePositions 的函式，使用者可以透過此函式看到尚未購買的門票

:::

:::danger

顯示尚未購票的位置(如下圖)

:::

### Concert Ticket Booking Menu

```

1) Important Information for Ticket Purchase
2) Purchase a Ticket
3) Return a Ticket
4) Show Booked Positions
5) Show Available Positions
6) Write Results to File
7) Read Results from File
8) void showSeatLayout
9) Search for a Ticket
10) Ticket Statistics

```

Choose a function, enter 0 to finish:

5

Available Positions:

```

 1 2 3 4 5 6 7 8 9 10
11 12 13 14 15 16 17 18 19 20
21 22 23 24 25 26 27 28 29 30
31 32 33 34 35 36 37 38 39 40
41 42 43 44 45 46 47 48 49 50

```

## 寫入檔案(Function 6)

:::success

- 以下是writeResultsToFile.c的程式碼

:::

```

#include <stdio.h>
#include "myheader.h"

```

```

#define NUM_POSITIONS_PER_ROW 10
#define NAME_LENGTH 15

void writeResultsToFile(Person Group[])
{
 FILE *file = fopen("ticket_results.txt", "w");
 if (file == NULL) {
 printf("Unable to open file.\n\n");
 return;
 }

 fprintf(file, "Booked Positions:\n");
 int count = 0;
 for (int i = 0; i < NUM_PERSONS; i++) {
 if (Group[i].hired) {
 fprintf(file, "%2d. %-15s ", Group[i].id, Group[i].name);
 count++;
 if (count % NUM_POSITIONS_PER_ROW == 0) {
 fprintf(file, "\n");
 }
 }
 }

 if (count % NUM_POSITIONS_PER_ROW != 0) {
 fprintf(file, "\n");
 }

 fclose(file);
 printf("Results written to file successfully.\n\n");
}

```

:::info

- 這段程式碼定義了一個名為 writeResultsToFile 的函式，使用者可以透過此函式將購買門票的結果寫入檔案

...

:::danger

寫入成功(如下圖)

...

## Concert Ticket Booking Menu

```
1) Important Information for Ticket Purchase
2) Purchase a Ticket
3) Return a Ticket
4) Show Booked Positions
5) Show Available Positions
6) Write Results to File
7) Read Results from File
8) void showSeatLayout
9) Search for a Ticket
10) Ticket Statistics
```

Choose a function, enter 0 to finish:

6

Results written to file successfully.

...danger

寫入之檔案(如下圖)

...



## 讀出檔案(Function 7)

...success

- 以下是readResultsFromFile.c的程式碼

...

```
#include <stdio.h>
#include "myheader.h"

void readResultsFromFile(Person Group[])
{
 FILE *file = fopen("ticket_results.txt", "r");
 if (file == NULL) {
 printf("\033[1;31m");
```

```

 printf("Unable to open file.\n\n");
 printf("\033[0m");
 return;
 }

 char line[256];
 while (fgets(line, sizeof(line), file) != NULL) {
 printf("%s", line);
 }

 fclose(file);
 printf("\n\033[1;32m");
 printf("Results read from file successfully.\n\n");
 printf("\033[0m");
}

```

:::info

- 這段程式碼定義了一個名為 readResultsFromFile 的函式，使用者可以透過此函式將購買門票的結果讀出檔案

...

:::danger

讀出檔案之結果(如下圖)

...

## Concert Ticket Booking Menu

```

1) Important Information for Ticket Purchase
2) Purchase a Ticket
3) Return a Ticket
4) Show Booked Positions
5) Show Available Positions
6) Write Results to File
7) Read Results from File
8) void showSeatLayout
9) Search for a Ticket
10) Ticket Statistics

```

Choose a function, enter 0 to finish:

7

Booked Positions:

10. curry

## 位置售出狀況相對圖(Function 8)

:::success

- 以下是showSeatLayout.c的程式碼

...

```
#include <stdio.h>
#include "myheader.h"

void showSeatLayout(Person Group[])
{
 printf("\033[1;34m");
 printf("Seat Layout:\n");
 printf("\033[0m");
 for (int row = 0; row < NUM_PERSONS / 10; row++) {
 for (int seat = 0; seat < 10; seat++) {
 int position = row * 10 + seat;
 if (Group[position].hired) {
 printf("\033[1;31m");
 printf("\033[41m X \033[0m");
 } else {
 printf("\033[1;32m");
 printf(" %2d ", Group[position].id);
 }
 }
 printf("\n");
 }

 printf("\n");
}
```

...info

- 這段程式碼定義了一個名為 showSeatLayout 的函式，使用者可以透過此函式將購買門票位置售出狀況相對圖輸出

...

...danger

輸出相對圖之結果(如下圖)

...

## Concert Ticket Booking Menu

- 1) Important Information for Ticket Purchase
- 2) Purchase a Ticket
- 3) Return a Ticket
- 4) Show Booked Positions
- 5) Show Available Positions
- 6) Write Results to File
- 7) Read Results from File
- 8) void showSeatLayout
- 9) Search for a Ticket
- 10) Ticket Statistics

Choose a function, enter 0 to finish:

8

Seat Layout:

1	2	3	4	5	6	7	8	9	X
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50

## 單獨查詢座位之購票情形(Function 9)

...success

- 以下是searchTicket.c的程式碼

...

```
#include <stdio.h>
#include "myheader.h"

void searchTicket(Person Group[])
{
 int ticketId;
 printf("Enter the ticket ID to search: ");
 scanf("%d", &ticketId);

 for (int i = 0; i < NUM_PERSONS; i++) {
 if (Group[i].id == ticketId) {
 printf("\033[1;34m");
 printf("Ticket Found:\n");
 printf("\033[0m");
 printf("ID: %d\n", Group[i].id);
 }
 }
}
```

```

 printf("Name: %s\n", Group[i].name);
 printf("Status: %s\n", Group[i].hired ? "Booked" : "Available");
 return;
 }
}

printf("\033[1;31m");
printf("Ticket not found.\n");
printf("\033[0m");
}

```

:::info

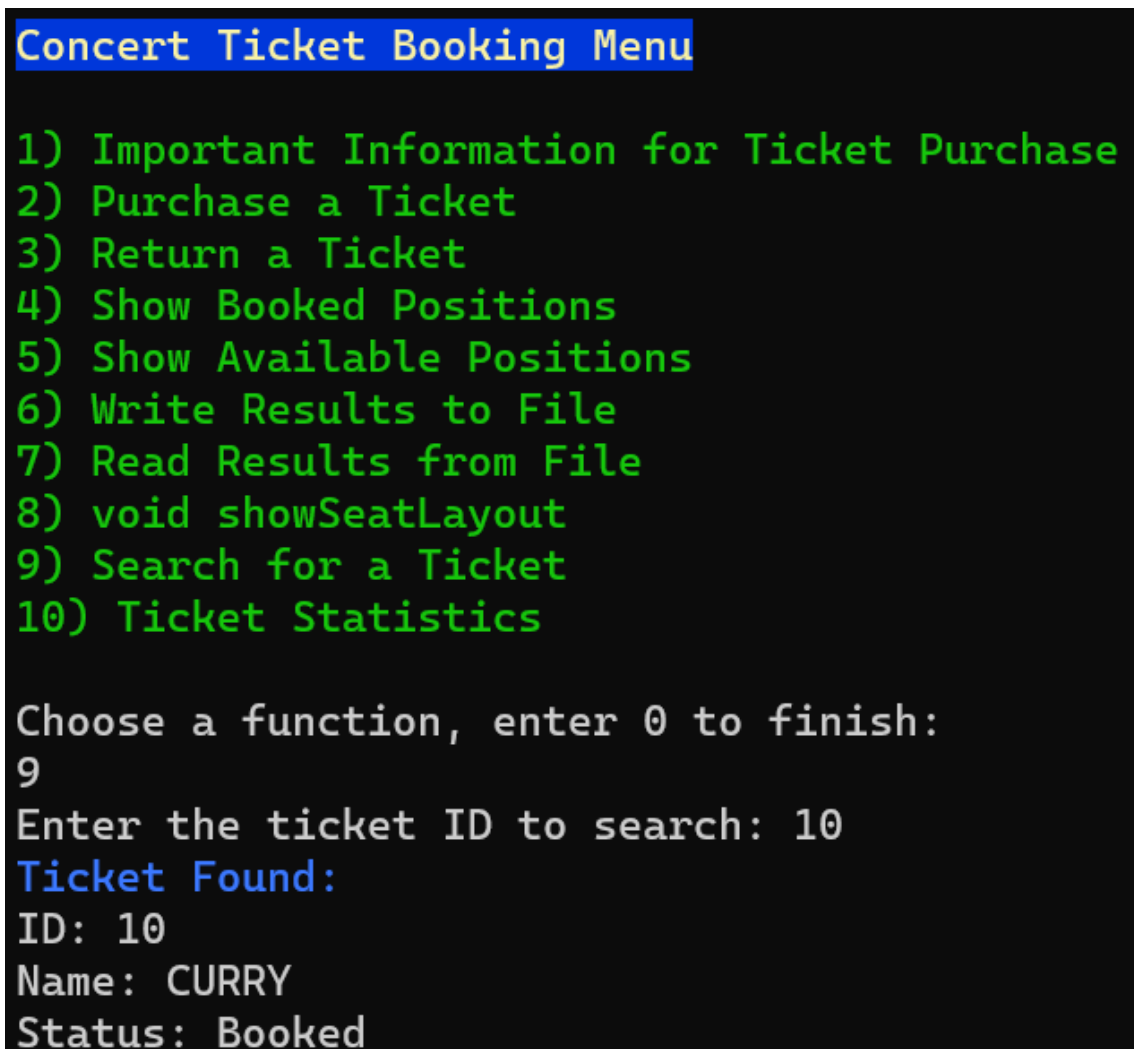
- 這段程式碼定義了一個名為 searchTicket 的函式，使用者可以透過此函式查詢各座位之購票情形

...

:::danger

如果查詢的位置有人已購票，會顯示人名及已售狀態(如下圖)

...



```

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Choose a function, enter 0 to finish:
9
Enter the ticket ID to search: 10
Ticket Found:
ID: 10
Name: CURRY
Status: Booked

```

:::danger

如果查詢的位置有人無人購票，不會顯示人名且會顯示未出售狀態(如下圖)

...



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Choose a function, enter 0 to finish:

9

Enter the ticket ID to search: 9

**Ticket Found:**

ID: 9

Name:

Status: Available

...danger

如果查詢的位置超出範圍，會顯示Ticket not found(如下圖)

...

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Choose a function, enter 0 to finish:

9

Enter the ticket ID to search: 100

**Ticket not found.**

## 呈現總購票數及剩餘票數(Function 10)

:::success

- 以下是ticketStatistics.c的程式碼

:::

```
#include <stdio.h>
#include "myheader.h"

void ticketStatistics(Person Group[])
{
 int bookedCount = 0;
 int availableCount = 0;

 for (int i = 0; i < NUM_PERSONS; i++) {
 if (Group[i].hired) {
 bookedCount++;
 } else {
 availableCount++;
 }
 }

 printf("\033[1;34m");
 printf("Ticket Statistics:\n");
 printf("\033[0m");
 printf("Total Booked Tickets: %d\n", bookedCount);
 printf("Total Available Tickets: %d\n", availableCount);
}
```

:::info

- 這段程式碼定義了一個名為 ticketStatistics 的函式，使用者可以透過此函式查詢總座位之購票情形

...

:::danger

顯示總購票數及剩餘票數(如下圖)

...

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```

Choose a function, enter 0 to finish:

10

**Ticket Statistics:**

Total Booked Tickets: 1

Total Available Tickets: 49

## 專題之結論心得

### 結論&心得

這次的期末專題報告是透過老師每周一點一點慢慢引導我們才有的結果，從一開始的懵懵懂懂到後面自己做出類似的專案主題，事實上，一開始聽到專案我是有些許嚇到的，因為一直以來我認為只有那些高階工程師才能生成有系統性的專案，怕自己不能接收到多少東西，不過透過每周清晰簡短的課程，讓我們都能體驗到寫簡易專案的程式，突然發現我也是可以冒出個簡單的雛形的，這次的課程我感受到相當大的成就感。

然而在做專案的過程中在除錯的部分是有點痛苦的，有時候解讀程式碼相當耗費精力，有時候又不太懂背後的運算邏輯，有時候一直找不到出錯的原因(基本是程式語言不夠熟練的問題...)，問了同學也得不到解答，就得找人工智慧查找可能出錯的原因，不過在一次次努力下成功寫出了各種選項帶給我蠻大的震撼。

其實在最後我認為在完成專題方面，我深刻體會到人工智慧的確是可以令我們加速學習的方式之一，不管是在程式的除錯、結構、資料及檔案的設置，人工智慧多數都能以相當快的速度及高正確率的結果呈現給使用者，我認為人工智慧的確是可以令我們進步的工具之一，更可以印證一句話，未來會被淘汰的也許是那些不會運用人工智慧的人。