

Experiment3-董皓彧

环境:

```
Visual Studio Code 1.83.0  
gcc version 8.1.0 (x86_64-win32-seh-rev0, Built by MinGW-w64 project)  
cmake version 3.27.7
```

必做题

必做题1

- 代码:

```
#include<stdio.h>  
#include<stdbool.h>  
  
void printSizeOf() {  
    // short, int, long, unsigned short,unsigned int, unsigned long, char,  
    bool, double  
    printf("size of short: %d\n", sizeof(short));  
    printf("size of int: %d\n", sizeof(int));  
    printf("size of long: %d\n", sizeof(long));  
    printf("size of unsigned short: %d\n", sizeof(unsigned short));  
    printf("size of unsigned int: %d\n", sizeof(unsigned int));  
    printf("size of unsigned long: %d\n", sizeof(unsigned long));  
    printf("size of char: %d\n", sizeof(char));  
    printf("size of bool: %d\n", sizeof(bool));  
    printf("size of double: %d\n", sizeof(double));  
    return;  
}  
  
void testFloat() {  
    float a = 1.0, history = 1.0;  
    int i = 1;  
  
    for(i=1; a!=0; i++) {  
        history = a;  
        a /= 10;  
    }  
    printf("float 能保留的最小精度为: %d\n", i-1);  
    printf("此时 float a = %.61f\n", history);  
    return;  
}  
  
int main() {  
    // print size of each type;  
    printSizeOf();  
  
    printf("\n");  
}
```

```
// test float
testFloat();
return 0;
}
```

- 输出:

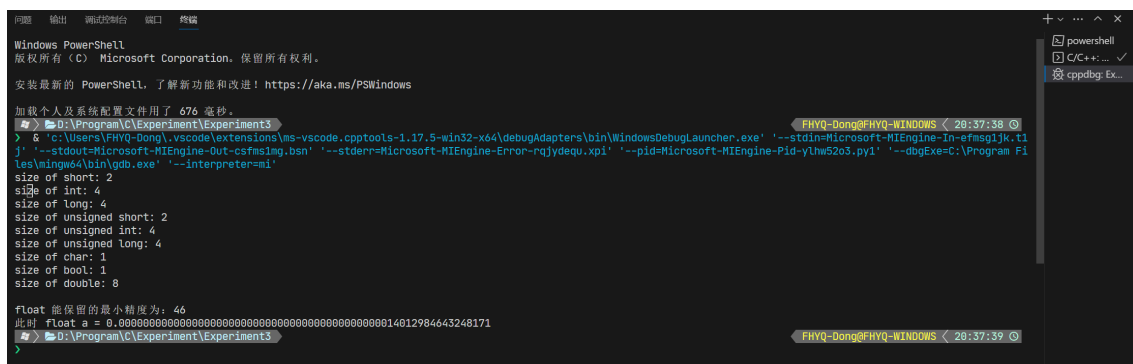
```
size of short: 2
size of int: 4
size of long: 4
size of unsigned short: 2
size of unsigned int: 4
size of unsigned long: 4
size of char: 1
size of bool: 1
size of double: 8
```

float 能保留的最小精度为: 46

此时 `float a =`

[illegible]

- 运行截图：



必做题2

- 代码:

```
#include<stdio.h>

#define SIZE_OF_MAP 15


int main() {
    int a = 0, b = 0;
    char c = '0', d = '0';

    printf("enter two number representing the ascii of two char: ");
    scanf("%d %d", &a, &b);

    if(a < 0 || a > 127 || b < 0 || b > 127) {
        printf("invalid input\n");
        return 0;
    }
    else {
        c = a; d = b;
    }
}
```

```

for(int i = 0; i < SIZE_OF_MAP; i++) {
    for(int j = 0; j < SIZE_OF_MAP; j++) {
        if(i == j || i + j == SIZE_OF_MAP - 1) printf("%c", c);
        else printf("%c", d);
    }
    printf("\n");
}
}
return 0;
}

```

- 输入:

```
enter two number representing the ascii of two char: 65 97
```

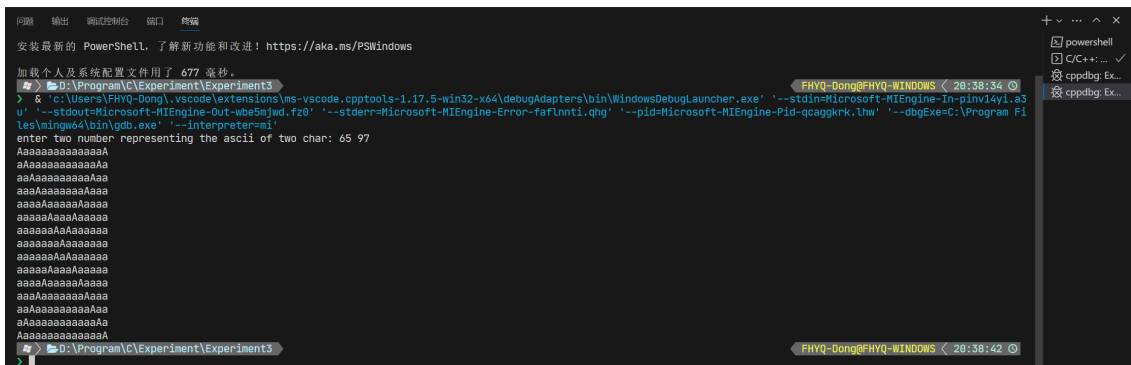
- 输出:

```

AaaaaaaaaaaaaA
aAaaaaaaaaaaaaAa
aaAaaaaaaaaaaaaAaa
aaaAaaaaaaaaaaaaAaaa
aaaaAaaaaaaAaaaa
aaaaaAaaaAaaaaa
aaaaaaAaAaaaaa
aaaaaaaAaaaaaa
aaaaaaaAaAaaaaa
aaaaaaaAaaaAaaaaa
aaaaAaaaaaaAaaaa
aaaAaaaaaaaAaaa
aaAaaaaaaaaAaa
aAaaaaaaaaaaaaAa
AaaaaaaaaaaaaA

```

- 运行截图:



必做题3

- 代码:

```

#include<stdio.h>
#define MAXTIME 100005 // 最长时间

```

```

struct Sheeps {
    int cntChild, cntAdult, cntAll; // 目前小羊和大羊的数量 (单位: 对)
    int value;
};

struct Sheeps asheep(int _cntChild, int _cntAdult, int _cntAll, int _value)
{ // "构造函数"
    struct Sheeps tmp;
    tmp.cntChild = _cntChild;
    tmp.cntAll = _cntAll;
    tmp.cntAdult = _cntAdult;
    tmp.value = _value;
    return tmp;
}

struct Sheeps dp_sheeps[MAXTIME];

int main() {
    dp_sheeps[1] = asheep(1, 0, 1, 10);
    for(int i=2; i<=6; ++i) {
        dp_sheeps[i].cntAdult = dp_sheeps[i-1].cntAdult + dp_sheeps[i-1].cntChild;
        dp_sheeps[i].cntChild = dp_sheeps[i-1].cntAdult;
        dp_sheeps[i].cntAll = dp_sheeps[i].cntAdult + dp_sheeps[i].cntChild;
        dp_sheeps[i].value = 10 * dp_sheeps[i].cntAll;
    }

    printf("Time\tAll\tAdult\tChild\tvalue\n");
    for(int i=1; i<=6; ++i) {
        printf("%d\t%d\t%d\t%d\t%d\n", i, dp_sheeps[i].cntAll,
        dp_sheeps[i].cntAdult, dp_sheeps[i].cntChild, dp_sheeps[i].value);
    }
    return 0;
}

```

- 输出:

Time	All	Adult	Child	Value
1	1	0	1	10
2	1	1	0	10
3	2	1	1	20
4	3	2	1	30
5	5	3	2	50
6	8	5	3	80

- 运行截图:

选做题

- 目录结构:

```
Optional-Exercise3
| CMakeLists.txt
| Optional-Exercise3-1.c
| Optional-Exercise3-1.c.bak
| Optional-Exercise3-1.exe
|
└─include
    CMakeLists.txt
    Map.c
    Map.h
    PhoneNum.c
    PhoneNum.h
```

- 代码: 见压缩包中的 `Optional-Exercise3.tar.gz`
- 输入0:

```
> Please input the number of phone numbers:
3
```

- 输出0:

无, 输入0是以下多个输出的前提

- 输入1:

```
> Please choose a option (i: insert, s: search, q:quit, l:list):
i
Please input the name:
AAA
Please input the phone number:
1111111111
```

- 输出1:

Insert successfully

- 输入2:

```
> Please choose a option (i: insert, s: search, q:quit, l:list):
i
Please input the name:
BBB
Please input the phone number:
2222222222
```

- 输出2:

```
Insert successfully
```

- 输入3:

```
> Please choose a option (i: insert, s: search, q:quit, l:list):  
s  
Please input the name:  
AAA
```

- 输出3:

```
-----  
Name      Phone Number  
AAA       11111111111
```

- 输入4:

```
> Please choose a option (i: insert, s: search, q:quit, l:list):  
i  
Please input the name:  
CCC  
Please input the phone number:  
33333333333
```

- 输出4:

```
Insert successfully
```

- 输入5:

```
> Please choose a option (i: insert, s: search, q:quit, l:list):  
s  
Please input the name:  
BBB
```

- 输出5:

```
-----  
Name      Phone Number  
BBB       22222222222
```

- 输入6:

```
> Please choose a option (i: insert, s: search, q:quit, l:list):  
s  
Please input the name:  
CCC
```

- 输出6:

```
-----  
Name      Phone Number  
CCC       3333333333
```

- 输入7:

```
> Please choose a option (i: insert, s: search, q:quit, l:list):  
i
```

- 输出7:

```
The phone number list is full
```

- 输入8:

```
> Please choose a option (i: insert, s: search, q:quit, l:list):  
s  
Please input the name:  
DDD
```

- 输出8:

```
Not found
```

- 输入9:

```
> Please choose a option (i: insert, s: search, q:quit, l:list):  
l
```

- 输出9:

```
-----  
Name      Phone Number  
AAA       1111111111  
BBB       2222222222  
CCC       3333333333
```

- 输入10:

```
> Please choose a option (i: insert, s: search, q:quit):  
q
```

- 输出10:

```
无, 程序退出
```

```

D:\Program\VC\Experiment\Experiments\Optional
C:\Program Files\Microsoft Visual Studio\Extensions\ms-vscode.cpptools-1.17.5-win32-x64\debugAdapters\bin\WindowsDebugLauncher.exe' --stdin=Microsoft-MIEngine-In-130v5w0t
260' '--stdout=Microsoft-MIEngine-Out-qfzrsjnf.130' '--stderr=Microsoft-MIEngine-Error-yv50o3q.slc' '--pid=Microsoft-MIEngine-Pid-4xx8bpyp.mec' '--dbgExe=C:\Prog
ram Files\mingw64\bin\gdb.exe' '--interpreter=mi'
> Please input the number of phone numbers:
3
> Please choose a option (i: insert, s: search, q:quit):
i
Please input the name:
AAA
Please input the phone number:
1111111111
Insert successfully

> Please choose a option (i: insert, s: search, q:quit):
i
Please input the name:
BBB
Please input the phone number:
2222222222
Insert successfully


> Please choose a option (i: insert, s: search, q:quit):
s
Please input the name:
AAA
-----
Name    Phone Number
AAA     1111111111

> Please choose a option (i: insert, s: search, q:quit):
i
Please input the name:
CCC
Please input the phone number:
3333333333
Insert successfully

> Please choose a option (i: insert, s: search, q:quit):
s
Please input the name:
BBB
-----
Name    Phone Number
BBB     2222222222

> Please choose a option (i: insert, s: search, q:quit):
s
Please input the name:
CCC
-----
Name    Phone Number
CCC     3333333333

> Please choose a option (i: insert, s: search, q:quit):
```



```
i
Please input the name:
CCC
Please input the phone number:
3333333333
Insert successfully

> Please choose a option (i: insert, s: search, q:quit):
s
Please input the name:
BBB
-----
Name      Phone Number
BBB      2222222222

> Please choose a option (i: insert, s: search, q:quit):
s
Please input the name:
CCC
-----
Name      Phone Number
CCC      3333333333

> Please choose a option (i: insert, s: search, q:quit):
i
The phone number list is full

> Please choose a option (i: insert, s: search, q:quit):
s
Please input the name:
DDD
Not found

> Please choose a option (i: insert, s: search, q:quit):
q
>
```