

Experiment3-董皓彧

环境:

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

必做题

必做题1

- 代码:

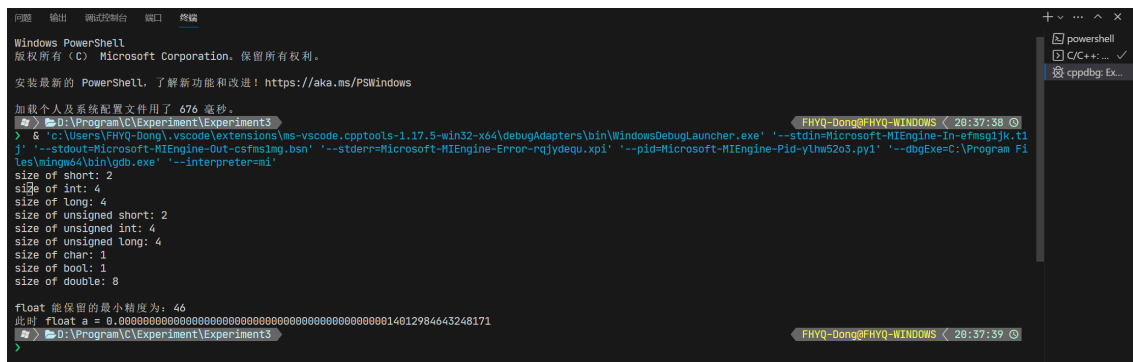
```
1  #include<stdio.h>
2  #include<stdbool.h>
3
4  void printSizeOf() {
5      // short, int, long, unsigned short,unsigned int, unsigned long,
      char, bool, double
6      printf("size of short: %d\n", sizeof(short));
7      printf("size of int: %d\n", sizeof(int));
8      printf("size of long: %d\n", sizeof(long));
9      printf("size of unsigned short: %d\n", sizeof(unsigned short));
10     printf("size of unsigned int: %d\n", sizeof(unsigned int));
11     printf("size of unsigned long: %d\n", sizeof(unsigned long));
12     printf("size of char: %d\n", sizeof(char));
13     printf("size of bool: %d\n", sizeof(bool));
14     printf("size of double: %d\n", sizeof(double));
15     return;
16 }
17
18 void testFloat() {
19     float a = 1.0, history = 1.0;
20     int i = 1;
21
22     for(i=1; a!=0; i++) {
23         history = a;
24         a /= 10;
25     }
26     printf("float 能保留的最小精度为: %d\n", i-1);
27     printf("此时 float a = %.61f\n", history);
28     return;
29 }
30
31 int main() {
32     // print size of each type;
33     printSizeOf();
34
35     printf("\n");
36 }
```

```
37     // test float
38     testFloat();
39     return 0;
40 }
```

- 输出:

[illegible]

- 运行截图:



必做题2

- 代码:

```
1 #include<stdio.h>
2 #define SIZE_OF_MAP 15
3
4 int main() {
5     int a = 0, b = 0;
6     char c = '0', d = '0';
7
8     printf("enter two number representing the ascii of two char: ");
9     scanf("%d %d", &a, &b);
10
11     if(a < 0 || a > 127 || b < 0 || b > 127) {
12         printf("invalid input\n");
13         return 0;
14     }
15     else {
16         c = a; d = b;
```

```

17     for(int i = 0; i < SIZE_OF_MAP; i++) {
18         for(int j = 0; j < SIZE_OF_MAP; j++) {
19             if(i == j || i + j == SIZE_OF_MAP - 1) printf("%c", c);
20             else printf("%c", d);
21         }
22         printf("\n");
23     }
24 }
25 return 0;
26 }

```

- 输入:

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

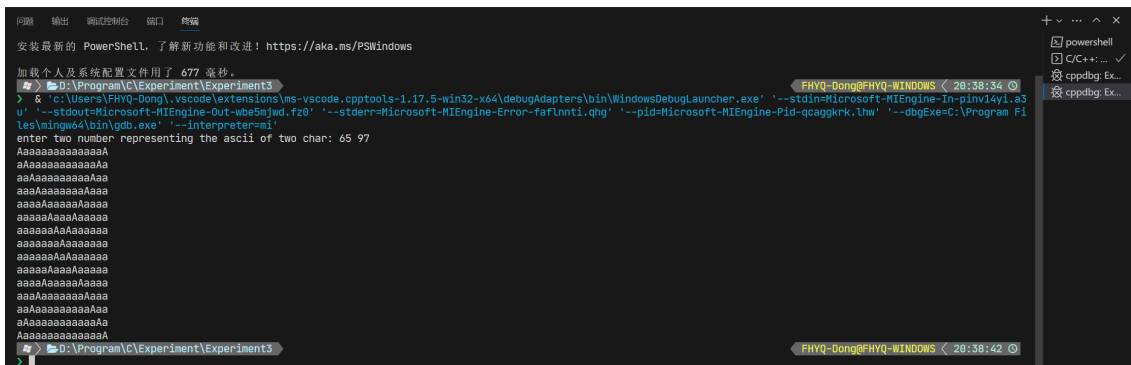
- 输出:

```

1 AaaaaaaaaaaaaA
2 aAaaaaaaaaaaaaAa
3 aaAaaaaaaaaaaaaAaa
4 aaaAaaaaaaaaaaaaAaaa
5 aaaaAaaaaaaAaaaa
6 aaaaaAaaaAaaaaa
7 aaaaaaAaAaaaaaa
8 aaaaaaaAaaaaaaa
9 aaaaaaAaAaaaaaa
10 aaaaaAaaaAaaaaa
11 aaaaAaaaaaAaaaa
12 aaaAaaaaaaaAaaa
13 aaAaaaaaaaaAaa
14 aAaaaaaaaaaaaaAa
15 AaaaaaaaaaaaaA

```

- 运行截图:



必做题3

- 代码:

```

1 #include<stdio.h>
2 #define MAXTIME 100005 // 最长时间
3

```

```

4 struct Sheeps {
5     int cntChild, cntAdult, cntAll; // 目前小羊和大羊的数量 (单位: 对)
6     int value;
7 };
8
9 struct Sheeps asheep(int _cntChild, int _cntAdult, int _cntAll, int
_value) { // "构造函数"
10     struct Sheeps tmp;
11     tmp.cntChild = _cntChild;
12     tmp.cntAll = _cntAll;
13     tmp.cntAdult = _cntAdult;
14     tmp.value = _value;
15     return tmp;
16 }
17
18 struct Sheeps dp_sheeps[MAXTIME];
19
20 int main() {
21     dp_sheeps[1] = asheep(1, 0, 1, 10);
22     for(int i=2; i<=6; ++i) {
23         dp_sheeps[i].cntAdult = dp_sheeps[i-1].cntAdult + dp_sheeps[i-
1].cntChild;
24         dp_sheeps[i].cntChild = dp_sheeps[i-1].cntAdult;
25         dp_sheeps[i].cntAll = dp_sheeps[i].cntAdult +
dp_sheeps[i].cntChild;
26         dp_sheeps[i].value = 10 * dp_sheeps[i].cntAll;
27     }
28
29     printf("Time\tAll\tAdult\tChild\tvalue\n");
30     for(int i=1; i<=6; ++i) {
31         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);
32     }
33     return 0;
34 }

```

- 输出:

1	Time	All	Adult	Child	value
2	1	1	0	1	10
3	2	1	1	0	10
4	3	2	1	1	20
5	4	3	2	1	30
6	5	5	3	2	50
7	6	8	5	3	80

- 运行截图:



选做题

- 目录结构:

```
1 optional-Exercise3
2 | CMakeLists.txt
3 | optional-Exercise3-1.c
4 | optional-Exercise3-1.c.bak
5 | optional-Exercise3-1.exe
6 |
7 | include
8 |     CMakeLists.txt
9 |     Map.c
10 |    Map.h
11 |    PhoneNum.c
12 |    PhoneNum.h
```

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

```
1 > Please input the number of phone numbers:
2 3
```

- 输出0:

```
1 无, 输入0是以下多个输出的前提
```

- 输入1:

```
1 > Please choose a option (i: insert, s: search, q:quit, l:list):
2 i
3 Please input the name:
4 AAA
5 Please input the phone number:
6 111111111111
```

- 输出1:

```
1 Insert successfully
```

- 输入2:

```
1 > Please choose a option (i: insert, s: search, q:quit, l:list):
2 i
3 Please input the name:
4 BBB
5 Please input the phone number:
6 2222222222
```

- 输出2:

```
1 Insert successfully
```

- 输入3:

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

- 输出3:

```
1 -----
2 Name      Phone Number
3 AAA       1111111111
```

- 输入4:

```
1 > Please choose a option (i: insert, s: search, q:quit, l:list):
2 i
3 Please input the name:
4 CCC
5 Please input the phone number:
6 3333333333
```

- 输出4:

```
1 Insert successfully
```

- 输入5:

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

- 输出5:

```
1 -----
2 Name      Phone Number
3 BBB       2222222222
```

- 输入6:

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

- 输出6:

```
1 | -----
2 | Name      Phone Number
3 | CCC       33333333333
```

- 输入7:

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

- 输出7:

```
1 | The phone number list is full
```

- 输入8:

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

- 输出8:

```
1 | Not found
```

- 输入9:

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

- 输出9:

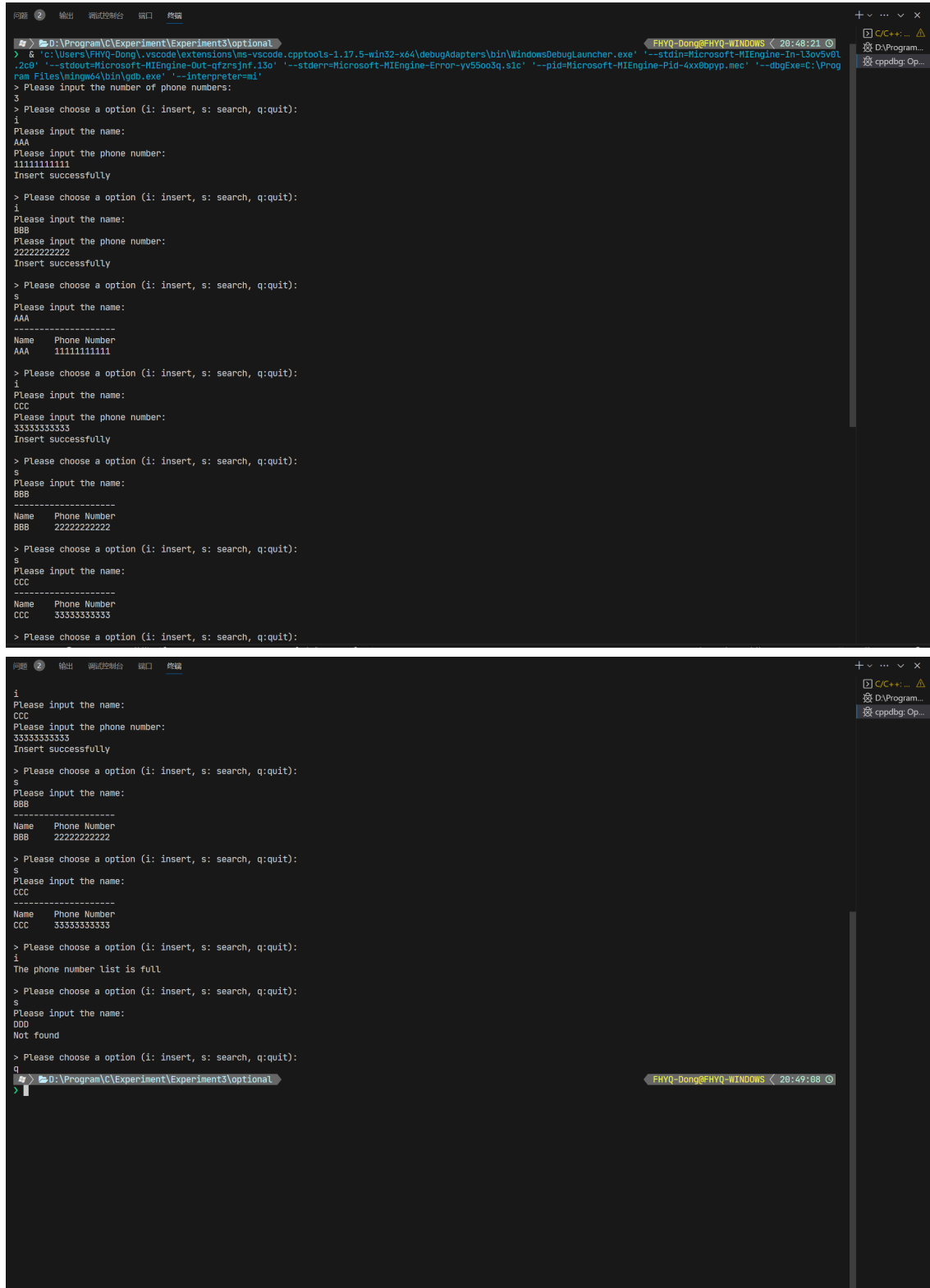
```
1 | -----
2 | Name      Phone Number
3 | AAA       11111111111
4 | BBB       22222222222
5 | CCC       33333333333
```

- 输入10:

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

- 输出10:

1 | 无，程序退出



```
> & "c:\Users\FHYQ-Dong\vscode\extensions\ms-vscode.cpptools-1.17.5-win32-x64\debugAdapters\bin\WindowsDebugLauncher.exe" '--stdin=Microsoft-MIEngine-In-130vsv01.2c0' '--stdout=Microsoft-MIEngine-Out-qfzrsjnf.130' '--stderr=Microsoft-MIEngine-Error-yv55oo3q.sic' '--pid=Microsoft-MIEngine-Pid-4xx8bpyy.mec' '--dbgExe=C:\Program 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):
q

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
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
>
```