Experiment4-董皓彧

环境:

```
gcc.exe (x86_64-win32-seh-rev0, Built by MinGW-W64 project) 8.1.0
Visual Stdio Code 1.83.1
```

作业仓库地址:
https://github.com/FHYQ-Dong/Tsinghua-Program-Design-Assignments/tree/main/Experiment4

必做题

Experiment4-1

代码:

```c
#include<stdio.h>
#include<math.h>
#define pi acos(-1)

void print_exp() {
    printf("input x: \n");
    double x = 0;
    scanf("%lf", &x);
    double tmp = exp(-0.5 * x * x);
    printf("f(x) = %lf\n", (1/sqrt(2 * pi)) * tmp);
    return;
}

void printf_sin_cos() {
    printf("input x y: \n");
    double x = 0, y = 0;
    scanf("%lf %lf", &x, &y);
    printf("f(x, y) = %lf\n", (double)(1)/3 * sin(x*x + y*y) * cos(x+y));
    return;
}

int main() {
    print_exp();
    printf_sin_cos();
    return 0;
}
```

输入1:

```
input x:
1
input x y:
1 1
```

输出1:

```
f(x) = 0.241971
f(x, y) = -0.126134
```

Experiment4-2

代码:

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

int main() {
    printf("(!x && x!=0) == false\n");
    printf("(!(x==a) && (y==b) && 0) == false\n");
    printf("(-10<a<5 && b==c) == false\n");
    printf("(5>3 && 2 || 8<4-!0) == true\n");
    printf("(!4<y<5 && 5<b<6) == true\n");
    printf("(!x || x!=0) == true\n");
    printf("(3<x<5 || y>3 && y<2) == true\n");
    return 0;
}
```

输入1:

```

```

输出1:

```
(!x && x!=0) == false
(!(x==a) && (y==b) && 0) == false
(-10<a<5 && b==c) == false
(5>3 && 2 || 8<4-!0) == true
(!4<y<5 && 5<b<6) == true
(!x || x!=0) == true
(3<x<5 || y>3 && y<2) == true
```

Experiment4-3

代码:

```c
#include<stdio.h>
#include<stdlib.h>
#define true 1
#define false 0
typedef int bool;

bool a = false, b = false, c = false; // false: 不是泄密者

bool argument_a(bool b, bool honest) { // b: a的谈论对象, honest: a说的话的真假
    return honest ? b==1 : b==0;
}
```

```
bool argument_b(bool c, bool honest) { // c: b的谈论对象, honest: b说的话的真假
    return honest ? c==1 : c==0;
}
bool argument_c(bool argv_b, bool honest) { // argv_b: b的谈论对象, honest: c说的话的真假
    return honest ? argument_b(argv_b, false) : argument_b(argv_b, true);
}

void init(int x) {
    a = x == 1;
    b = x == 2;
    c = x == 3;
    return;
}

bool check() {
    bool result = false;
    for(int ha=0; ha<=1; ++ha) {
        for(int hb=0; hb<=1; ++hb) {
            for(int hc=0; hc<=1; ++hc) {
                result |= argument_a(b, ha) && argument_b(c, hb) && argument_c(c, hc);
                if (argument_a(b, ha) && argument_b(c, hb) && argument_c(c, hc)) {
                    printf("若甲说%s话, 乙说%s话, 丙说%s话, 则:\n", ha?"真":"假", hb?"真":"假", hc?"真":"假");
                }

            }
        }
    }
    return result;
}

int main() {
    bool flag = false;
    for(int i=1; i<=3; ++i) {
        init(i);
        if(check()) printf("可能的泄密者是%s\n", i==1?"甲":i==2?"乙":"丙"), flag = true;
    }
    if(!flag) printf("没有泄密者\n");
    return 0;
}
```

输入1:

```

```

输出1:

```
若甲说假话，乙说假话，丙说真话，则:
可能的泄密者是甲
若甲说真话，乙说假话，丙说真话，则:
可能的泄密者是乙
若甲说假话，乙说真话，丙说假话，则:
可能的泄密者是丙
```

选做题

Optional-Experiment4-1

代码:

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

typedef int bool;
#define true 1
#define false 0

int cnt15, cnt10, cnt5;
bool flag;

int main() {
    for(cnt15=98; cnt15>0; --cnt15) {
        for(cnt10=99-cnt15; cnt10>0; --cnt10) {
            cnt5 = 100 - cnt15 - cnt10;
            if(cnt15*15 + cnt10*10 + cnt5*5 == 1000) {
                flag = true;
                goto end;
            }
        }
    }
end:
    if(flag) printf("%d只母鸡，%d只公鸡，%d只小鸡\n", cnt15, cnt10, cnt5);
    else printf("无解\n");
    return 0;
}

```

输入1:

```

```

输出1:

```
49只母鸡，2只公鸡，49只小鸡
```