

Data Structure and Algorithm Hw1

- 1 Use Correct File Name, hw1_4.c or hw1_4.cpp
- 2 Use Correct Input and Output Format

Sample Input

```
3 2
-2 3
0
```

Sample Output *(Note that the AAA, BBB, ... should be filled by the actual numbers.)*

```
Case (3, 2): GCD-By-Def = 1, taking AAA iterations
Case (3, 2): GCD-By-Reverse-Search = 1, taking BBB iterations
Case (3, 2): GCD-By-Filter = 1, taking CCC iterations
Case (3, 2): GCD-By-Filter-Faster = 1, taking DDD iterations
Case (3, 2): GCD-By-Euclid = 1, taking EEE iterations
Case (-2, 3): ...
```

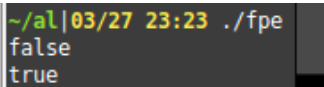
Figure: Input and Output Format

Notice Floating point error

Notice Floating Point Error.

- 1 Floating-point numbers cannot precisely represent all real numbers.
- 2 Floating-point operations cannot precisely represent true arithmetic operations.

```
#include <stdio.h>
#include <math.h>
int main(){
    float a = 1/3.0;
    if( 1 - a * 3.0 != 0){
        printf(" false\n");
    }
    if( fabs(1 - a * 3.0) <= 1e-5){
        printf(" true\n");
    }
    return 0;
}
```



```
~/al|03/27 23:23 ./fpe
false
true
```

Figure: Floating point error Example

Avoid Undefined Behavior

Some operation is undefined in language.

```
#include <stdio.h>
int f1(){
    printf("f1\n");
    return 1;
}
int f2(){
    printf("f2\n");
    return 2;
}
int main(){
    printf("%d %d\n", f1(), f2());
    return 0;
}
```

```
#include <stdio.h>
int main(){
    int i=0;
    i = i++;
    printf("%d\n", i);
    return 0;
}
```