Handout 1
C++ Programming
Deadline October 5

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Exercise 1

Given the following assignment of variables to values:

x	power	y	item	MIN	DAY	num	MAX	Sens
-5	1024	7	1.5	-12.0	'M'	12	1024	12

Fill in the result values of the conditions in the table below:

Condition	Result
`(x>y) && !y`	false
`(item>MIN)||(DAY!='M')`	true
`((num*128)<power)&&y`	true
`(!(power!=MAX))&&(Sens==num)`	false
`((y+x)<num)||(DAY=='M')`	true
`(Sens*(!y))!=0`	false
`(!x||y)&&(!y||x)`	true

Exercise 2

Write a program in C++ that performs the following tasks:

1. Read three integer values using **cin.**
2. Determine the maximum of the three values entered by the user.
3. Print the maximum of this three values using **cout.**

```
#include <iostream>

// 2. Determine the maximum of the three values entered by the user.
int get_max(int a[]) {
    return
        a[0]>=a[1]? a[0]>=a[2] ? a[0] : a[2] :
        a[1]>=a[2] ? a[1] : a[2];
}

int main() {
    int n[3];
    std::cin >> n[0] >> n[1] >> n[2]; // 1. Read three integer values using cin.
    std::cout << get_max(n) << std::endl; // 3. Print the maximum of this three
values using cout.
}
```

Exercise 3
Write a program that asks the user to type numbers. After each entry, the program should report the cumulative sum of the entries. The program should terminate when the user enters 0.

```
#include <iostream>

int main() {
    int n = 0;
    for(;;) {
        int input;
        std::cin >> input;
        if (!input) break;
        n+=input;
        std::cout << n << std::endl;
    }
}
```

Exercise 4
Create a program to determine the GCD (Greatest Common Divisor) of two integers x and y using a 'while loop'.

Formal description of the Euclidean algorithm

- **Input** Two positive integers, a and b.
- **Output** The greatest common divisor, g, of a and b.
- **Internal computation**
    1. If a<b, exchange a and b.
    2. Divide a by b and get the remainder, r.
       If r=0, report b as the GCD of a and b.
    3. Replace a by b and replace b by r. Return to the previous step.

```
#include <iostream>

int gcd(int a, int b) {
    if(a<b) return gcd(b,a);
    int q, r;
    while(1) {
        q = a / b;
        r = a % b;
        if(!r) return b;
        a = b;
        b = r;
    }
}
int main() {
    int a, b;
    std::cin >> a >> b;
    std::cout << gcd(a,b) << std::endl;
}
```