Week 07
Exercise

2018 Fall
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Exercise 0

Create a simple up-down game.
Generate random natural numbers less than 100.

Example

$ ./a.out
80
Down!
50
Down!
20
Up!
35
Yes! Try: 4
Exercise 1

Write a function that takes two integers and returns the greatest common divisor (최대공약수).
Use this function to create a function that returns the least common multiple. (최소공배수).

Example

Prototype

```
$ ./a.out
24 36
12 72
```

```c
int gcd(int n1, n2);
int lcm(int n1, n2);
```
Exercise 2

Write a **recursive** function that takes an integer and returns a factorial.

Example

```
$ ./a.out
5
120
```

Prototype

```c
int factorial(int n);
```
Exercise 3

Write functions to calculate permutation (순열) and combination (조합). Use the factorial function created in Exercise 2.

Example

```
$ ./a.out
5 3
60 10
```

Prototype

```
int permutation(int n, int r);
int combination(int n, int r);
```

\[ nP_r = nC_r \times r! \]

\[ nC_r = \frac{nP_r}{r!} = \frac{n!}{(n-r)! \times r!} \]
Exercise 4

Write a recursive function to obtain the Nth Fibonacci sequence. The first and second of the sequence are considered to be 1.

Example

```
$ ./a.out
10
55
```

Prototype

```
int fibonacci(int n);
```