CS487-Introduction to competitive programming: A2SV

Lecture #2: Importance of algorithms + Types, Loops, Functions

What's an Algorithm

- In general; step-by-step procedure for solving a problem
- In CS; well-defined computational procedure that takes a set of values as input and produces another set of values as output

Algorithm Examples

- Fibonacci f(n) = f(n-1)+ f(n-2)

  f(1) = f(2) = 1

- Summation

- Sorting
- Shortest path
- Compression

C++ Types

Type	Size (in bytes)	Range
char	1	-127 to 127 or 0 to 255
unsigned char	1	0 to 255
int	4	-2147483648 to 2147483647
unsigned int	4	0 to 4294967295
short int	2	-32768 to 32767
unsigned short int	2	0 to 65,535
long int	4	-2147483648 to 2147483647
unsigned long int	4	0 to 4294967295
float	4	+/- 3.4e +/- 38 (~7 digits)
double	8	+/- 1.7e +/- 308 (~15 digits)

- Depends on your environment
- Check on your computer

Problem Solving

Sum 2 big numbers

Calculate a+b for

$-10^{1000000} \leq a,b \leq 10^{1000000}$

Problem Solving

Multiply 2 big numbers

Calculate a*b for

-10^1000000 <= a,b <= 10^1000000

Environment Practice

-Codeforces

- Watermelon
- Theatre Square

Environment Practice

-LeetCode

- Two sum
- Add two numbers
- Reverse integer

Quote of the day

"Live as if you were to die tomorrow. Learn as if you were to live forever." - Mahatma Gandhi