Competitive Programming Tools

Don’t Reinvent the Wheel in the Contest

- Contests often provide C / C++ / Java / Python
  - In ICPC Taiwan, we also offer Kotlin.
- Built-in functions and libraries
  - C string
  - C++ STL
  - Java BigInteger
  - Python eval
- Team note: up to 25 pages

C: string.h

- strlen
  - Linear time!!!
- strcat
  - Linear time!
- strstr
  - Linear time
- strtok
  - Use strtok with sscanf / atoi for line-based input

C++ STL: Utilities

- pair
- tuple
- bitset

C++ STL: Containers and Iterators

- vector
- list
- queue
- priority_queue
- set
- unordered_set
- map
- unordered_map

C++ STL: algorithm

- sort stable_sort
- lower_bound upper_bound
- random_shuffle
- merge
- nth_element
- next_permutation prev_permutation

Java BigInteger

- Built-in advanced arithmetic functions
  - modInverse, modPow, gcd, probablePrime, nextProbablePrime, isProbablyPrime, …
- Java does not allow operator overloading
  - Can be very tedious
  - Much more comfortable in Kotlin
- Java I/O tricks
  - Scanner is too slow for competitive programming
  - Use BufferedReader and StringTokenizer for input processing
  - Use StringBuffer/StringBuilder for output buffering

Python

- In general, Python is too slow for competitive programming.
  - ICPC World Finals and serious contests allow Java to pass all test data.
- Built-in big integer and big decimal
  - Like Java but more efficient
  - Without probablePrime-series function
- No built-in TreeSet / TreeMap
- eval
- Help you to analyze the problems