ICPC Template Notebook

Contents

Contest

template.cpp

```cpp
#include <bits/stdc++.h>
using namespace std;

using i64 = long long;
using i32 = int32_t;

i32 main() {
    cin.tie(0)->sync_with_stdio(0);
    return 0;
}
```

.bashrc

```
com() {
    g++ "$1.cpp" -o "$1" -std=c++20
    ↪  -fsanitize=address,undefined,signed-integer-overflow -ggdb
}
coms() {
    g++ "$1.cpp" -o "$1" -std=c++20
}
```

Mathematics

DSA

Strings

KMP

```cpp
vector<int> kmp(string &s) {
    int n = ssize(s);
    vector<int> pre(n);
    int len = 0;
    for (int i = 1; i < n; i++) {
        while (len > 0 && s[i] != s[len]) len = pre[len - 1];
        if (s[len] == s[i]) pre[i] = ++len;
    }
    return pre;
}
```

Geometry

Common Formulas

Combinatorics

Catalan Numbers:

$$\frac{1}{n+1}\binom{2n}{n}$$

Generalized Catalan Numbers:

$$\frac{n-m+1}{n+1}\binom{n+m}{m}$$

Probability

Expected number of trials before first success:

$$\frac{1}{p}$$

Probability of having exactly k successes after n trials:

$$\binom{n}{k}p^k(1-p)^{n-k}$$

Trigonometry

Angle sum formulas:

$$\sin(a+b) = \sin(a)\cos(b) + \sin(b)\cos(a)$$

$$\cos(a+b) = \cos(a)\cos(b) - \sin(a)\sin(b)$$

$$\tan(a+b) = \frac{\tan(a)+\tan(b)}{1-\tan(a)\tan(b)}$$