SOME USEFUL SHORT-TRICKS FOR COMPETITIVE CODING

Many times this happens in competitive programming competitions where you've figured out an algorithm for the solution of the problem, which happens to be a standard algorithm. How helpful would it be to have snippets for commonly used concepts/algorithms in competitive programming in that situation, to provide you an edge over fellow competitors as using snippets will improve your accuracy, speed and hence rank!

Most of us are not familiar with the standard library of c++. The most useful header file which is mostly used in CC(competitive coding) is **#include<bits/stdc++.h>** .It is basically a header file that includes every standard library. In programming contests, using this file is a good idea, when you want to reduce the time wasted in doing chores; especially when your rank is time sensitive.
For more info visit : https://www.geeksforgeeks.org/bitsstdc-h-c/

In this handbook we will focus on how we can already create a template which can reduce our time during Competitive Programming Competitions. And what are some useful macros and functions which I can already include in my template.

Contents

1. What are Snippets?

It is basically reusable pieces of code that can be integrated into a larger codebase. Developers often talk about snippets having certain functions and discuss how to implement snippets in constructing larger and more complicated programs.

It can be understood by a function. When we want to use some piece of code again and again , we generally define a function and put that reusable code in it.
Now whenever we want to use that, we just simply call it.
Similarly in Snippet, when we know that this code or information will be inserted in all our files, we create a snippet and save it into our editor. Now whenever we require it we just call it. Or we can insert it into every New file.

One way to think about it is building with more defined code modules, rather than just building with raw code.

2. How are the snippets useful in competitive programming?

In Competitive Programming, we all want to save our time and we have to solve our question as fast as possible , then why should one waste so much time in writing raw code like:

```
#include<bits/stdc++.h>
using namespace std;
int main()
{
        return 0;
}
```

We all know this starter code will be included in all our further program. How useful it will be if I save this code in my editor and whenever i want to write a program I will simply call it. And How amazing it will be if it is already written in my every new file.

This will be amazing and will save your precise time in CC.

3.How can I create a template in my Editor (ex DevC++, Atom, Sublime) ?

Every text editor provide this feature of creating template.
Here i will demonstrate for Dev C++ for others you will be provided link.

Now here is a video clip just go through this:
https://www.youtube.com/watch?v=98lArfUf0Gk&t=8s

4.What are some macros which we can include in our C++ Code?

1. **Useful constant**

```
#define INF  (int)1e9
#define EPS   1e-9
#define MOD 1000000007ll
#define PI 3.14159
```

2. **For standard input-output**

```
#define fio ios_base::sync_with_stdio(false);cin.tie(NULL);cout.tie(NULL)
```

3. **Iteration macros: have advantage of auto-casting and not recomputing arguments**

```
#define rep(i,a,n) for (int i=a;i<n;i++)
#define per(i,a,n) for (int i=n-1;i>=a;i--)
#define setBit(S, j) (S |= (1 << j))
#define clearBit(S, j) (S &= ~(1 << j))
#define toggleBit(S, j) (S ^= (1 << j))
```

4. **For easy Input**

```
#define in(x,n)   for(int e=0;e<n;e++){ll y;cin>>y;x.pb(y);}
```

5. **For easy Output**

```
#define print(x)    for(auto it:x) cout<<it<<' '; cout<<endl;
#define printii(x)  for(auto it:x) cout<<it.F<<' '<<it.S<<'\t';  cout<<endl;
```

6. For some data type

```
#define ll long long
#define vi vector<ll>
#define vvi vector<vi>
#define ii pair<ll,ll>
#define pll pair<ll,ll>
#define vii vector<ii>
#define vvii vector<vii>
#define viii vector<pair<ii,ll>>
#define pb push_back
#define ppb pop_back
#define eb emplace_back
#define mp make_pair
#define F first
#define S second
#define uset unordered_set
#define umap unordered_map
```

5. What are the some Useful functions which we can include in our C++ Code?

1. For Greatest common divisor(gcd)

```
ll gcd(ll a, ll b){ll temp;while (b > 0){temp = a%b;a = b;b = temp;} return a;}
```

2. For Least Common Multiple (lcm)

```
ll lcm(ll a, ll b){return a*b/gcd(a,b);}
```

3. For Fast exponential

```
ll fpow(ll  b, ll exp, ll mod){if(exp == 0) return 1;ll t =
fpow(b,exp/2,mod);if(exp&1) return t*t%mod*b%mod;return t*t%mod;}
```

4. For Fast Divmod

```
ll divmod(ll i, ll j, ll mod){i%=mod,j%=mod;return i*fpow(j,mod-2,mod)%mod;}
```

7. How can I insert my name or some attractive design to make code more attractive? (For Fun)

a) You can use Banner command in linux to create your name in some attractive manner.
b) Here is a c++ program link which is just similar to banner command , it can also do this https://github.com/AdminAbhi/TextBanner/blob/master/TextBanner.cpp
c) Put comment and then just simply enter whatever you want to enter.
d) Here is a C++ Template

https://github.com/rajawatlks/-How-to-create-a-template-on-Dev-C-for-Competitive-Programming/blob/master/new

Ex: