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## 1 Shell Script

```
1 #!/bin/bash
2 clear
3 g++ $1.cpp -DDBG -o $1
4 if [[ "$?" == "0" ]]; then
5     echo Running
6     ./$1 <$1.in> $1.out
7     echo END
8 fi
```

## 2 Libraries

### 2.1 cstdlib

```
1 #include <cstdlib>
2 using namespace std;
3
4 int main() {
5     // Function: String conversion
6     double atof(const char* str);
7         // Convert string to double
8     int atoi(const char* str);
9         // Convert string to integer
10    long int atol(const char* str);
11        // Convert string to long integer
12    long long int atoll(const char* str);
13        // Convert string to long long integer
14    double strtod(const char* str, char** endptr);
15        // Convert string to double;
16    float strtof(const char* str, char** endptr);
17        // Convert string to float
18    long int strtol(const char* str, char** endptr,
19        int base);
20        // Convert string to long integer
21    long double strtold(const char* str, char**
22        endptr);
23        // Convert string to long double
24    long long int strtoll(const char* str, char**
25        endptr, int base);
26        // Convert string to long long integer
27    unsigned long int strtoul(const char* str, char**
28        endptr, int base);
29        // Convert string to unsigned long integer
30    unsigned long long int strtoull(const char* str,
31        char** endptr, int base);
32        // Convert string to unsigned long long
33        integer
34
35    // Function: Integer arithmetics
36    int abs(int n);
37    long int llabs(long int n);
38    long long int llabs(long long int n);
```

```
// Absolute value
```

### 2.2 algorithm

```
1 #include <algorithm>
2 using namespace std;
3
4 int main() {
5     // FI(ForwardIterator)
6     // RAI(RandomAccessIterator)
7     // BI(BidirectionalIterator)
8     void sort(RAI first, RAI last);
9
10    FI lower_bound(FI first, FI last, const T& k);
11    /* 最左邊 ≥ k 的位置 */
12
13    FI upper_bound(FI first, FI last, const T& k);
14    /* 最左邊 > k 的位置 */
15
16    pair<FI,FI> equal_range(FI first, FI last, const
17        T& k);
18    /* 等於 k 的範圍 [lower_bound, upper_bound) */
19
20    bool next_permutation(BI first, BI last);
21    /* 使用已經排序(由小到大)的資料，產生下一組排列 */
22
23    bool prev_permutation(BI first, BI last);
24    /* 針對逆向排序(由大到小)的資料，產生上一組排列 */
25
26    return 0;
27 }
```

### 2.3 map

### 2.4 set

### 2.5 vector

### 2.6 string

## 3 Algorithms

### 3.1 最短路

#### 3.1.1 Bellman-Ford

#### 3.1.2 Dijkstra's

### 3.2 LIS - Longest Increasing Subsequence

## 4 Formula

### 4.1 thm

- 中文測試

$$\sum_{i=1}^n i^2 = \frac{n(n+1)(2n+1)}{6}$$