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## 1 Section1

### 1.1 basic

```

1 #include <bits/stdc++.h>
2 using namespace std;
3 #define ll long long
4
5 int main() {
6
7     cout<<"for define \n";
8     return 0;
9 }

```

## 2 Section2 Math

### 2.1 GCD

```

1 #include<iostream>
2 using namespace std;
3 int GCD(int x,int y){
4     while(y != 0){
5         return GCD(y,x%y);
6     }
7     return x;
8 }
9
10 int main(){
11     int a,b;
12     cin>>a>>b;
13     int gcd = GCD(a,b);
14     int lcm = a*b/gcd;
15
16     cout<<"最大公因數為: "<<gcd<<"\n";
17     cout<<"最小公倍數為: "<<lcm<<"\n";
18     return 0;
19 }

```

## 3 Section3 String

### 3.1 string

```

1 #include<iostream>
2 #include<string>
3 using namespace std;
4

```

```

5 int main(){
6     //初始化字串
7     string s1 = "",s2 = "";
8     long long a;
9     int b;
10
11     //吃整行(含空格)
12     getline(cin,s1);
13
14     //compare,assign,串接
15     s1 == s2;
16     s1 = s2;
17     s1 += s2[i];
18
19     //字串切割,i:起始位置,len:幾個
20     s1 = s1.substr(i,len);
21
22     //轉成數字或數字轉字串
23     s1 = to_string(a);
24     s2 = to_string(b);
25     a = stoll(s1);
26     b = stoi(s2);
27
28     //判斷數字,字母
29     isdigit(s1[i]);
30     isalpha(s2[i]);
31     return 0;
32 }

```

## 4 Section4 小工具

### 4.1 permutation

```

1 #include<iostream>
2 #include<algorithm>
3 using namespace std;
4
5 int main(){
6     string a = "abc";
7     string b = "cba";
8     sort(a.begin(),a.end());
9     do{
10         cout<<a<<"\n";//把更新的字串印出
11     }while(next_permutation(a.begin(),a.end()));//產生下一個排列
12
13     bool isSamePer =
14         is_permutation(a.begin(),a.end(),b.begin());//檢查b字串
15     prev_permutation(a.begin(),a.end());//產生上一個排列結果
16
17     return 0;
18 }

```

## 5 Section5 Graph

### 5.1 floyd

```

1 //N為點的個數,G為記錄路徑長的二維振烈
2 for(int k=0; k<N; k++){
3     for(int i=0; i<N; i++){
4         for(int j=0; j<N; j++){
5             G[i][j]=min(G[i][j],G[i][k]+G[k][j]);
6         }
7     }
8 }

```

### 5.2 Dijkstra

```

1 struct Data{
2     int u,w;
3     bool operator< (const Data&rhs) const
4     {
5         return w>rhs.w;
6     }
7 };
8
9 int sol(int s, int e){
10     memset(d,0x3f,sizeof(d)); //INF版的memset
11     memset(vis,0,sizeof(vis));
12     d[s] = 0;
13     priority_queue<Data> pq;
14     pq.push(Data{s,0});
15
16     while(!pq.empty()){
17         Data k = pq.top();
18         pq.pop();
19         int ss = k.s;
20         if(ss==e) return d[ss];
21         if(vis[ss]) continue;
22         vis[ss] = 1;
23
24         for(int i=0; i<G[ss].size(); i++){
25             int u = G[ss][i].first, w =
                G[ss][i].second;
26             if(w>rr) continue;
27             if(d[u][rr-w]>d[ss][rr]){
28                 d[u][rr-w] = d[ss][rr];
29                 pq.push(Data{u,rr-w,d[u][rr-w]});
30             }
31         }
32     }
33     return -1;
34 }
35 }

```

## 7 數學公式

### 7.1 thm

• 中文測試

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

## 6 Java

### 6.1 java biginteger

```

1 import java.io.*;
2 import java.util.*;
3 import java.math.BigInteger;
4
5 public class bigint {
6     public static void main(String args[]) {
7         Scanner cin = new Scanner(System.in);
8         //Java大數運算宣告BigInteger
9         //首先宣告plus代表做加法運算
10        BigInteger plus = BigInteger.valueOf(0);
11        //首先宣告minus代表做減法運算
12        BigInteger minus = BigInteger.valueOf(0);
13        while ( cin.hasNext() ) {
14            //接下來讀入一整行字串
15            String str = cin.next();
16            //宣告num代表讀入進來的一整行數字
17            //然後把str丟到BigInteger num裡面
18            BigInteger num = new BigInteger(str);
19            if ( str.equals("0") ) break;
20            else {
21                plus = plus.add(num);
22                minus = minus.subtract(num);
23            }
24        }
25        System.out.print("The plus sum is " + plus +
26            "\n");
27        System.out.print("The minus sum is " + minus
28            + "\n");
29    }
30 }

```