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1 Graph Theory

1.1 DFS

```
1 vector<int> G[N];
2 bitset<N> vis;
3 void dfs(int s) {
4     vis[s] = 1;
5     for (int t : G[s]) {
6         if (!vis[t])
7             dfs(t);
8     }
9 }
```

1.2 BFS

```
1 vector<int> G[N];
2 bitset<N> vis;
3 void bfs(int s) {
4     queue<int> q;
5     q.push(s);
6     vis[s] = 1;
7     while (!q.empty()) {
8         int v = q.front();
9         q.pop();
10        for (int t : G[v]) {
11            if (!vis[t]) {
12                q.push(t);
13                vis[t] = 1;
14            }
15        }
16    }
17 }
```

1.3 Disjoint Set

```
1 int Find(int x) {
2     if (x == p[x])
3         return x;
4     return p[x] = find(p[x]);
5 }
6
7 void Uni(int a, int b){
8
9     a = Find(a);
10    b = Find(b);
11
12    if (a == b)
13        return;
14    if (p[a] < p[b]){
15        p[a] = p[a] + p[b];
16    }
17    p[b] = a;
18 }
19
20 int main(){
21
22     // initial
23     for(i = 0; i < N; i++){
24         p[i] = -1;
```

```
25     }
26
27     // input and union
28     for(i = 0; i < M; i++){
29         cin >> a >> b;
30         Uni(a, b);
31     }
32 }
```

2 Number Theory

2.1 thm

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