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1 Graph Theory

1.1 DFS

```cpp
vector<int> G[N];
bitset<N> vis;
void dfs(int s) {
    vis[s] = 1;
    for (int t : G[s]) {
        if (!vis[i])
            dfs(i);
    }
}
```

1.2 BFS

```cpp
vector<int> G[N];
bitset<N> vis;
void bfs(int s) {
    queue<int> q;
    q.push(s);
    vis[s] = 1;
    while (!q.empty()) {
        int v = q.front();
        q.pop();
        for (int t : G[v]) {
            if (!vis[t]) {
                q.push(t);
                vis[t] = 1;
            }
        }
    }
}
```

1.3 Disjoint Set

```cpp
int Find(int x) {
    if (x == p[x])
        return x;
    return p[x] = find(p[x]);
}

void Uni(int a, int b){

    a = Find(a);
    b = Find(b);

    if (a == b)
        return;
    if (p[a] < p[b]){
        p[a] = p[a] + p[b];
    }
    p[b] = a;
}

int main(){

    // initial
    for(i = 0; i < N; i++){
        p[i] = -1;
    }

    // input and union
    for(i = 0; i < M; i++){
        cin >> a >> b;
        Uni(a, b);
    }
}
```

2 Number Theory

2.1 thm

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