

```
1  #include <iostream>
2  #include <vector>
3
4  using namespace std;
5
6  class U {
7  public:
8      int n;
9      vector<int> p, s;
10
11     U(int _) {
12         n = _;
13         p.resize(n);
14         s.resize(n);
15         for (int i = 0; i < n; i++) {
16             p[i] = i;
17             s[i] = 1;
18         }
19     }
20
21     bool connect(int a, int b) {
22         int ap, bp;
23         for (ap = p[a]; ap != p[ap]; ap = p[ap]);
24         for (bp = p[b]; bp != p[bp]; bp = p[bp]);
25         if (ap == bp)
26             return true;
27         int mi = min(ap, bp), ma = max(ap, bp);
28         p[ma] = mi;
29         s[mi] += s[ma];
30         s[ma] = 0;
31         for (int pp = a; pp != mi;) {
32             int next = p[pp];
33             p[pp] = mi;
34             pp = next;
35         }
36         for (int pp = b; pp != mi;) {
37             int next = p[pp];
38             p[pp] = mi;
39             pp = next;
40         }
41         return false;
42     }
43
44     int q(int a) {
45         int ap;
46         for (ap = a; ap != p[ap]; ap = p[ap]);
47         return s[ap];
48     }
49
50     int parent(int a) {
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51  int ap;
52  for (ap = a; ap != p[ap]; ap = p[ap]);
53  return p[ap];
54  }
55
56  bool query(int a, int b) { return parent(a) == parent(b); }
57  };
58
59  int main() {
60  int n;
61  cin >> n;
62  U u(n);
63  }
64
```