

04/26/18 02:03:40 D:\git-repos\data-structure-homework\07\e21.cpp

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1  #include <cstdio>
2  #include <cstring>
3  #include <vector>
4  #include <set>
5  #include <map>
6  #define MXN 1007
7  using namespace std;
8  set<vector<int>> sts;
9  vector<int> v[MXN];
10 int n, m;
11 int seq[MXN], loc[MXN];
12 char tag[MXN];
13 #define MREPMXN 1007
14 typedef int MREPTP;
15
16 MREPTP _SEQ[MREPMXN << 1 | 1];
17
18 int minrep(MREPTP a[], int n) {
19     memset(_SEQ, 0, sizeof(_SEQ));
20     memcpy(_SEQ, a, sizeof(MREPTP) * n);
21     memcpy(_SEQ + n, _SEQ, sizeof(MREPTP) * n);
22     int i = 0, j = 1, k;
23     while (j < n) {
24         k = 0;
25         while (j + k < (n << 1) && _SEQ[i + k] == _SEQ[j + k]) ++k;
26         if (j + k == (n << 1)) break;
27         else if (_SEQ[i + k] > _SEQ[j + k]) {
28             i = std::max(i + k + 1, j);
29             j = i + 1;
30         } else j += k + 1;
31     }
32     return i;
33 }
34
35 void dfs(int root, int dep) {
36     if (tag[root] == 1) {
37         vector<int> tmp;
38         int x = minrep(seq + loc[root], dep - loc[root]);
39         for (int i = loc[root] + x; i < dep; ++i)
40             tmp.push_back(seq[i]);
41         for (int i = loc[root]; i < loc[root] + x; ++i)
42             tmp.push_back(seq[i]);
43         sts.insert(tmp);
44         return;
45     }
46     tag[root] = 1;
47     seq[dep] = root;
48     loc[root] = dep;
49     for (auto i : v[root]) {
50         dfs(i, dep + 1);
51     }
52     tag[root] = 2;
53 }
54 int main() {
55     scanf("%d %d", &n, &m);
56     for (int i = 0; i < m; ++i) {
57         int a, b;
58         scanf("%d %d", &a, &b);
59         v[a].push_back(b);
60     }
61     for (int i = 1; i <= n; ++i)
62         if (tag[i] == 0)
63             dfs(i, 0);

```

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64     printf("Found %d distinct simple cycles, expressed in their minimum
representation:\n", sts.size());
65     for (auto i : sts) {
66         for (auto j : i)
67             printf("%d ", j);
68         putchar('\n');
69     }
70 }
71 /**
72 root > ... > git-repos > data-structure-homework > 07 > g++ e21.cpp -std=c++11
73 root > ... > git-repos > data-structure-homework > 07 > ./a.out < master
74 4 7
75 1 2
76 2 3
77 3 4
78 4 1
79 1 3
80 3 2
81 2 4
82 Found 5 distinct simple cycles, expressed in their minimum representation:
83 1 2 3 4
84 1 2 4
85 1 3 2 4
86 1 3 4
87 2 3
88 root > ... > git-repos > data-structure-homework > 07 > ./a.out < master
89 7 11
90 5 6
91 5 7
92 7 6
93 6 2
94 7 4
95 2 4
96 2 3
97 4 1
98 1 2
99 3 1
100 4 3
101 Found 3 distinct simple cycles, expressed in their minimum representation:
102 1 2 3
103 1 2 4
104 1 2 4 3
105 root > ... > git-repos > data-structure-homework > 07 > < master
106 */

```