//articulation point

//time complexit : O(V+E)

//be in sorat peida mish ke agar raas morede nazar ma agar root bash ke age shakhe haye ziresh bishtar

// az 1 bashand ba hazf root etesal beyn onha ghat mishe v halat dovom ine ke agar farzandan yek ras

// agar be pedaran ras yali nadashteh bashand v ras ham root nabashe pas ba hazf in ras ertebat ghat

//mishe.

1. #include <iostream>
2. #include <vector>
3. #include <cstring>
5. **using** **namespace** std;
6. #define MAX1 10001
8. vector<int > arr[MAX1];
9. int visited[MAX1];
10. int low[MAX1];
11. int start[MAX1];
12. int parent[MAX1];
13. int artpoint[MAX1];//save articulation point
14. int counter=0;
15. void dfs1(int u){
16. visited[u]=1;
17. low[u]=start[u]=++counter;
18. int children=0;
20. for(int i=0;i<arr[u].size();i++){
21. int v=arr[u][i];
22. if(!visited[v]){
23. parent[v]=u;
24. children++;
25. dfs1(v);
26. low[u]=min(low[u],low[v]);
27. if(parent[u]==-1 && children>1){
28. artpoint[u]=1;
29. }
30. if( parent[u]!=-1 && low[v]>=start[u]){
31. artpoint[u]=1;
32. }
33. }else{
34. if(parent[u] != v){
35. low[u]=min(low[u],start[v]);
36. }
37. }
38. }
39. }
40. int main() {
41. int T;cin>>T;
42. for(int t=0;t<T;t++){
43. int n;cin>>n;
44. int m;cin>>m;
45. for(int i=0;i<MAX1;i++){
46. arr[i].clear();
47. }
48. memset(low,0, sizeof(low));
49. memset(start,-1, sizeof(start));
50. memset(visited,0, sizeof(visited));
51. memset(parent,-1, sizeof(parent));
52. memset(artpoint,0, sizeof(artpoint));
53. counter=0;
54. for(int i=0;i<m;i++){
55. int u;cin>>u;
56. int v;cin>>v;
57. arr[u].push\_back(v);
58. arr[v].push\_back(u);
59. }
60. for(int i=1;i<=n;i++){
61. if(!visited[i]){
62. dfs1(i);
63. }
64. }
65. int sum=0;
66. for(int i=1;i<=n;i++){
67. if(artpoint[i])sum++;
68. }
69. cout<<"Case "<<t+1<<": "<<sum<<endl;
71. }
73. return 0;
74. }