

图论

有向图中的环检测

$S \leftarrow$ Set of all nodes

for each node u in S do

 paintWhite(u)

for each node u in S do

 DFS(u)

function DFS(node u)

 if u is grey

 print “cycle detected”

 if u is white then

 paintGrey(u)

 for each node v with an edge from u to v do

 DFS(v)

 paintBlack(u)

拓扑排序（逆序）

```
S ← Set of all nodes
for each node u in S do
    paintWhite(u)
for each node u in S do
    DFS(u)
function DFS(node u)
    if u is grey
        print "cycle detected"
        exit
    if u is white then
        paintGrey(u)
        for each node v with an edge from u to v do
            DFS(v)
        paintBlack(u)
        output u
```