

Cyclomatic Number - Software Testing

Another property of graphs has deep implications for testing: cyclomatic complexity.

Definition:

The cyclomatic number of a graph G is given by $V(G) = e - n + p$, where

e is the number of edges in G

n is the number of nodes in G

p is the number of components in G

$V(G)$ is the number of distinct regions in a graph. Recall our discussion of vector spaces and the notion of a basis set. One formulation of structural testing postulates the notion of basis paths in a program and shows that the cyclomatic number of the program is the number of these basis elements.

The cyclomatic number of our example graph is $V(G) = 5 - 7 + 2 = 0$. When we use cyclomatic complexity in testing, we will (usually) have strongly connected graphs, which will generate graphs with large cyclomatic complexity.