

Example of control flow graph used in class

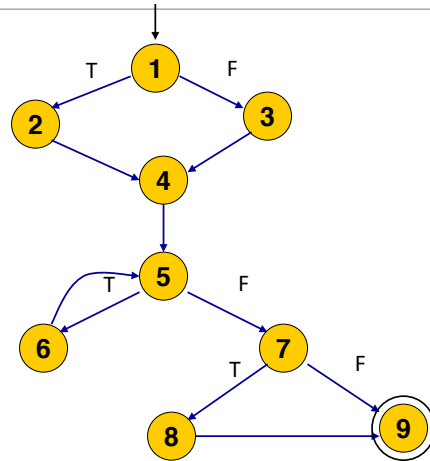
SUDIPTO GHOSH

An example (x^y)

```
1. scanf(x, y); if(y < 0)
2.     pow = 0 - y;
3. else pow = y;
4. z = 1.0;
5. while(pow != 0)
6.     { z = z * x; pow = pow - 1; }
7. if ( y < 0 )
8.     z = 1.0/z;
9. printf(z);
```

An example (x^y)

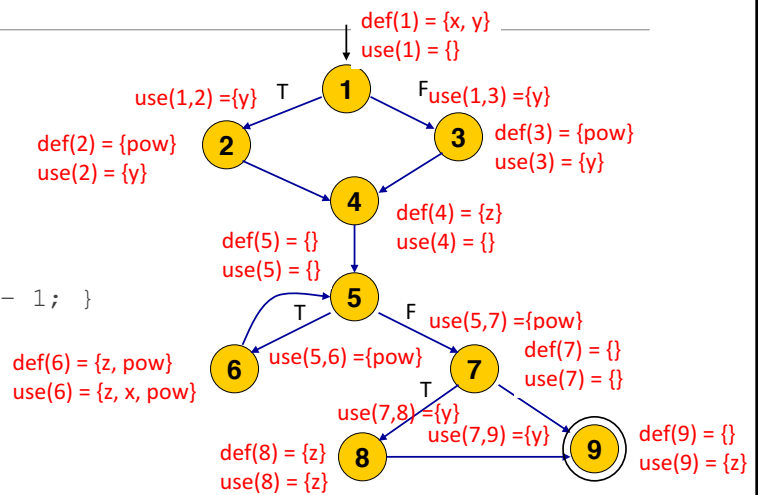
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General approach

FOR EACH node m DO

FOR EACH variable v *defined* IN m DO

identify a node n or edge e in the graph

where v is *used without prior definition*, and

n (or e) can be reached via a path containing at least one edge

The pairs (m, n) and (m, e) are DU or def-use pairs.

Not a DU pair if v is first defined and also used later in the same node

- Is pair $(8, 8)$ in Textbook notes a valid DU pair?
- Is pair $(4, 4)$ in Textbook notes, or pair $(6, 6)$ for variable z a valid DU pair?

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Class questions

1. For variable x defined in node 1, list the nodes where there are uses of that variable.
2. For variable z defined in node 4, list the nodes where there are uses of that variable.
3. For variable z defined in node 9, list the nodes from where the definition of z may have arrived from.
4. What must happen for definition of z in node 4 to be used in node 8?
5. What must happen for definition of pow in node 2 to be used in edge $(5,7)$?

