

Esercizi su *metriche di struttura*

Esercizio 1

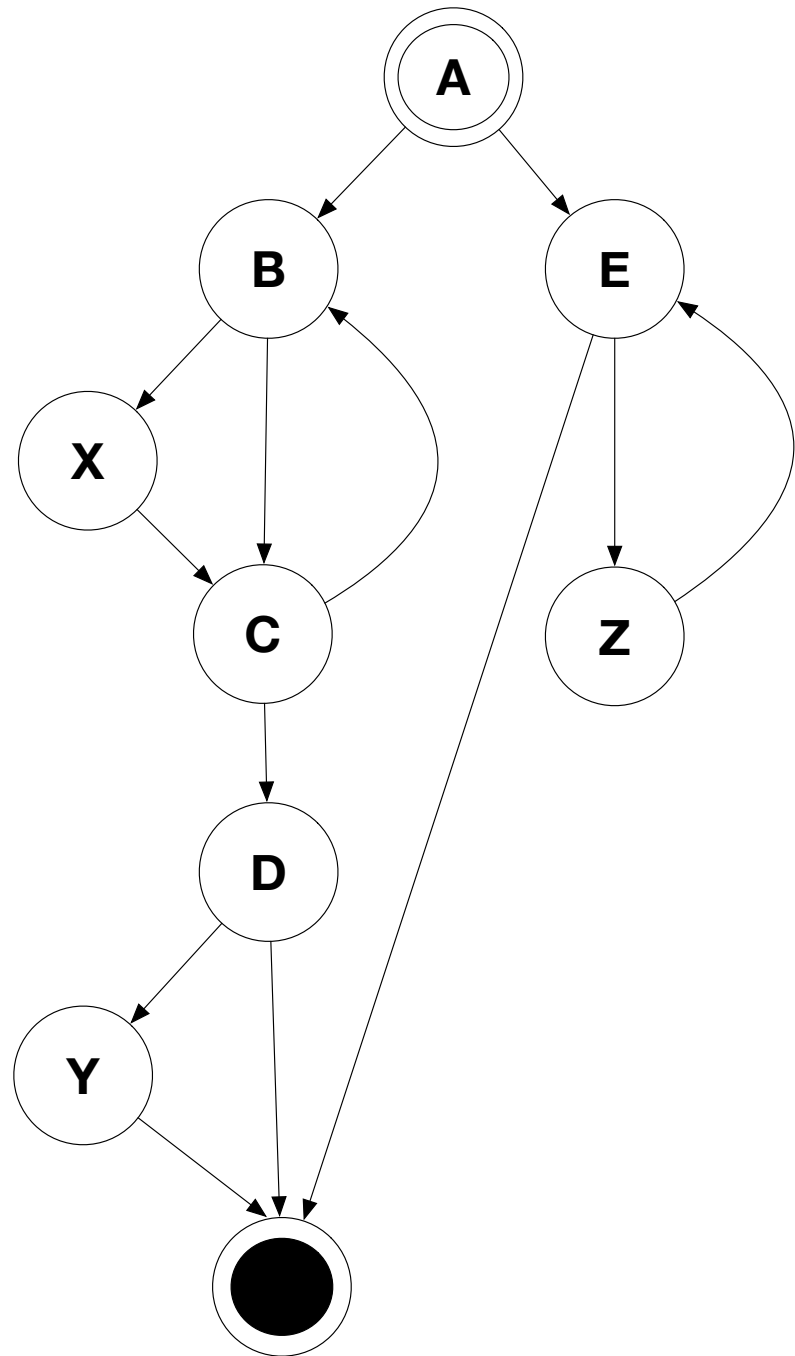
- Dare il flow-graph del modulo descritto dalla formula

$$F = D1((D3(D0); D0), D2)$$

ed esprimerne

- *pseudo-codice*
- *depth of nesting*
- *D-structuredness*
- *complessità ciclomatica*

Flow-graph



Pseudo-codice

BEGIN

if A then

 BEGIN

 repeat

 if B then X;

 until C;

 if D then Y;

 END

else

 while E do Z;

END

Depth of nesting

$F = D1(F1, F2)$ dove

$F1 = P2(D3(D0); D0)$

$F2 = D2$

$n(F) = 1 + \max\{F1, F2\}$

$= 1 + \max\{d((D3(D0); D0), d(D2))\} =$

$= 1 + \max\{\max\{d(D3(D0)), d(D0)\}, 1\} =$

$= 1 + \max\{\max\{1 + \max\{d(D0), 1\}, 1\} =$

$= 1 + \max\{\max\{1+1, 1\}, 1\} =$

$= 1 + \max\{2, 1\} =$

$= 1 + 2 = 3$

D-structuredness

$F = D1(F1, F2)$ dove

$F1 = P2(D3(D0); D0)$

$F2 = D2$

$$\begin{aligned} d(F) &= \min\{d(F1), d(F2)\} = \\ &= \min\{\min\{d(D3), d(D0)\}, 1\} = \\ &= \min\{\min\{1, 1\}, 1\} = \\ &= \min\{1, 1\} = 1 \end{aligned}$$

Complessità ciclomatica

$$\begin{aligned}v(F) &= e - n + 2 = \\ &= 13 - 9 + 2 = 6\end{aligned}$$

$$\begin{aligned}v(F) &= 1 + d = \\ &= 1 + 5 = \\ &= 6\end{aligned}$$

$$ev(F) = v(F) - m = 6 - 5 = 1$$

Esercizio 2

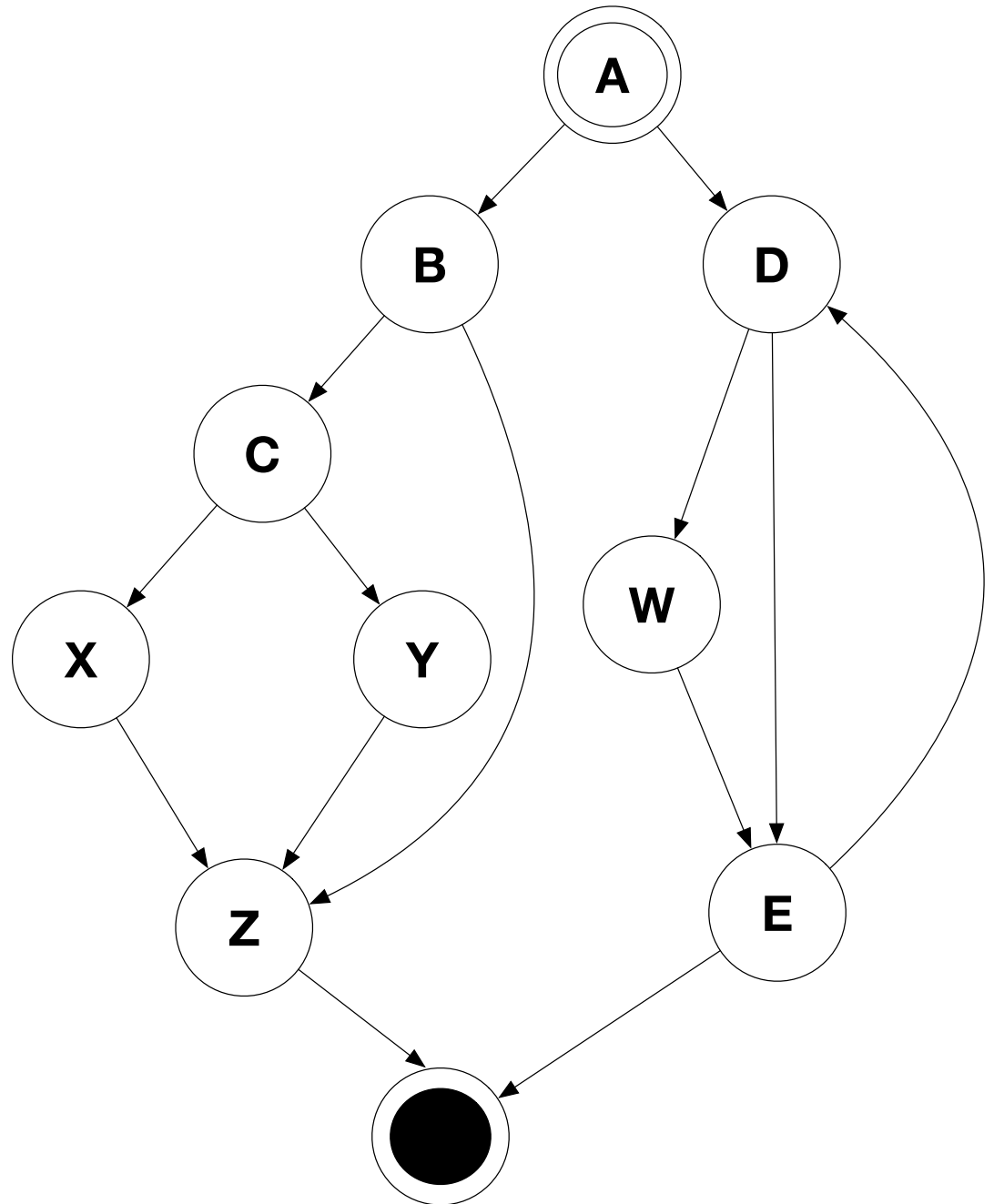
- Dare il flow-graph del modulo descritto dalla formula

$$F = D1((D0(D1); P1), D3(D0))$$

ed esprimerne

- *pseudo-codice*
- *depth of nesting*
- *D-structuredness*
- *complessità ciclomatica*

Flow-graph



Pseudo-codice

BEGIN

if A then

 if B then

 if C then X;

 else Y;

 Z;

else

 repeat

 if D then W;

 until E;

END

Depth of nesting

$F = D1(F1, F2)$ dove

$F1 = P2(D0(D1); P1)$

$F2 = D3(D0)$

$n(F) = 1 + \max\{F1, F2\}$

$= 1 + \max\{n((D0(D1); n(P1))), n((D3(D0)))\} =$

$= 1 + \max\{\max\{1 + n(D1), 1\}, 1 + \max\{1\}\} =$

$= 1 + \max\{\max\{2, 1\}, 1 + 1\} =$

$= 1 + \max\{2, 2\} =$

$= 1 + 2 = 3$

D-structuredness

$F = D1(F1, F2)$ dove

$F1 = P2(D0(D1); P1)$

$F2 = D3(D0)$

$$\begin{aligned} d(F) &= \min\{d(F1), d(F2)\} = \\ &= \min\{d(D0(D1)), d(P1), d(D3), d(D0)\} = \\ &= \min\{d(D0), d(D1), d(P1), d(D3), d(D0)\} = \\ &= \min\{1, 1, 1, 1, 1\} = 1 \end{aligned}$$

Complessità ciclomatica

$$\begin{aligned}v(F) &= e - n + 2 = \\ &= 14 - 10 + 2 = 6\end{aligned}$$

$$\begin{aligned}v(F) &= 1 + d = \\ &= 1 + 5 = \\ &= 6\end{aligned}$$

$$ev(F) = v(F) - m = 6 - 5 = 1$$