

TD 6

Test Structurel

Bu 19.10.20

- Exo 1:
- Tests informels - par exemple:

Test 1 : Test a l'interieur d'un long mois : $\text{days}(1,1,31,1,1972) = 30$

Test 2 : Test a l'interieur d'un court mois : $\text{days}(1,4,30,4,1972) = 29$

← Test 3 : Test long-court : $\text{days}(31,3,1,4,1972) = 1$ →

- CFG:

- AllTransitions:

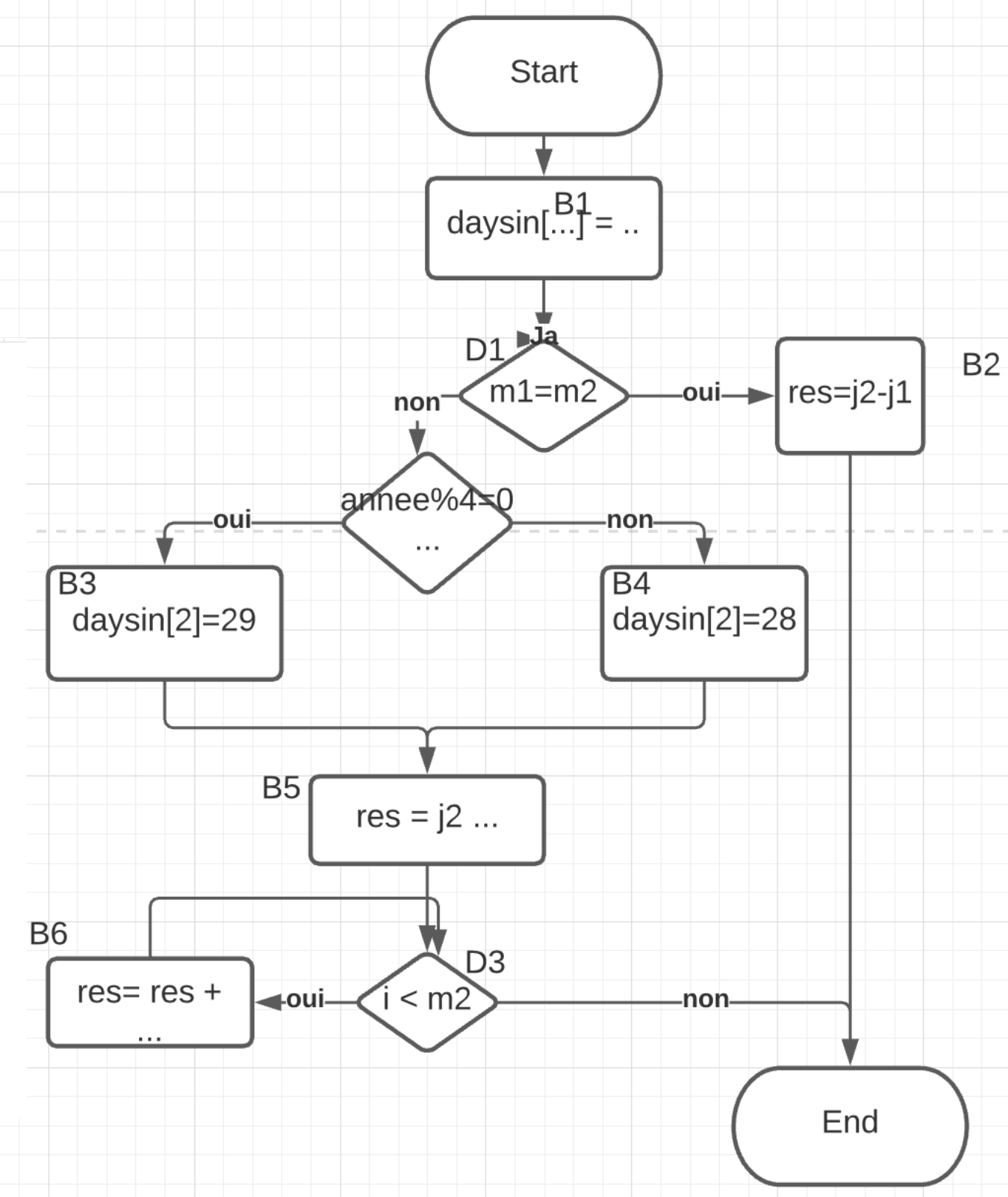
AllTransitions(CFG) = { [Start, B1, D1,B2,End],
 [Start,B1,D1,D2,B3,B5,D3,End],
 [Start,B1,D1,D2,B4,B5,D3,B6,D3,End]}

Cas: [Start, B1, D1,B2,End] :
 Test: days (1,1,1,31,1972) resultat attendu: 30.

Cas: [Start,B1,D1,D2,B3,B5,D3,End] :
 Test : days(1,2,1,3,2020) resultat attendu: 29

Cas: [Start,B1,D1,D2,B4,B5,D3,B6,D3,End]
 Test : days(1,2,1,3,2021) resultat attendu: 28

On a trouve des cas concrets, ca veut dire: AllTransitions(CFG) est FAISABLE.



- Exo 1:

- AllInstructions

On a trouve des cas concrets, ca veut dire: AllTransitions(CFG) est FAISABLE.

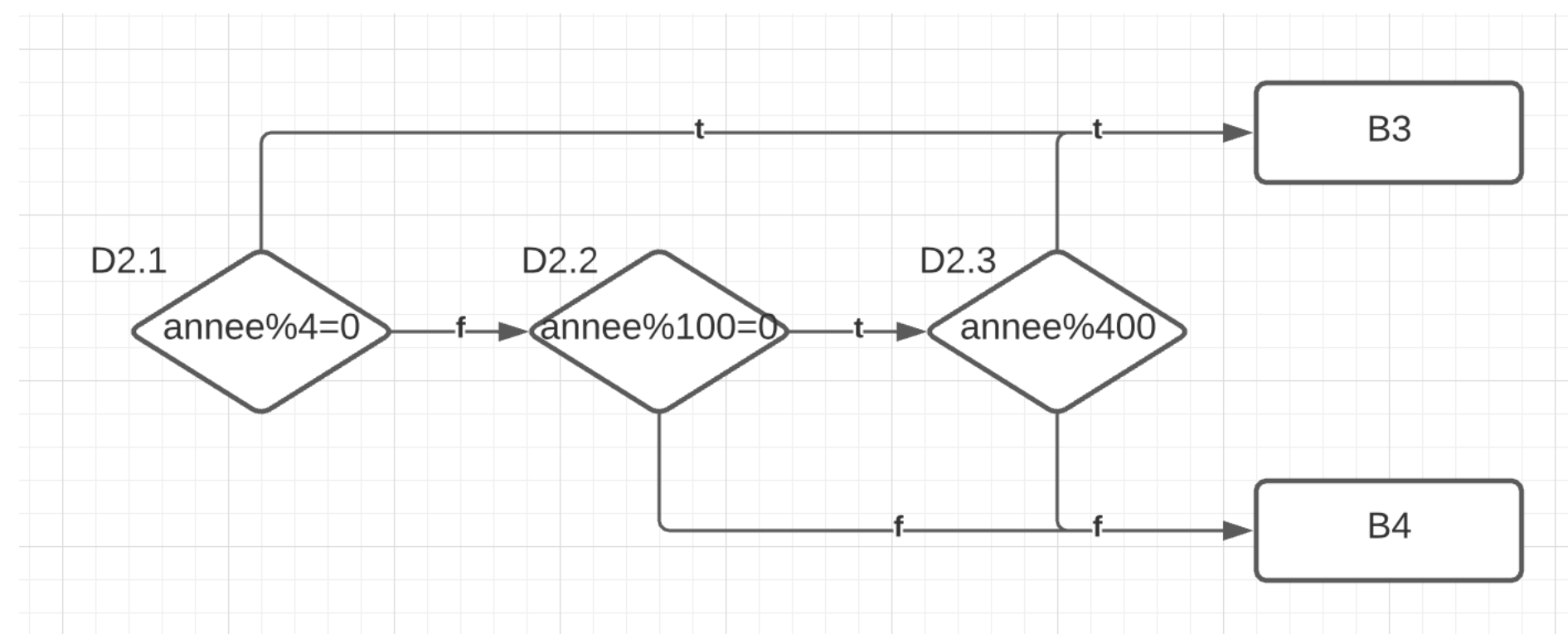
AllInstructions(CFG) = AllTransitions(CFG) (* dans ce cas *)

Donc AllInstructions(CFG) est FAISABLE

- A New Criterion: MCDC (Modified Condition/Condition Coverage)

Idea: making all atoms in condition once true and one false.

Observation: corresponds to AllTransitions in a modified CFG':



- Exo 1:

- AllInstructions

MCDCC(CFG) = AllTransitions(CFG') =

{[Start,B1,D1,D2.1,B3,B5,D3,B6,D3,End],
[Start,B1,D1,D2.1,D2.2,B4,B5,D3,End],
[Start,B1,D1,D2.1,D2.2,D2.3,B3,B5,D3,End],
[Start,B1,D1,D2.1,D2.2,D2.3,B4,B5,D3,End],
[Start,B1,D1,B2,End]}

- Semiformal coverage:

Cas: [Start, B1, D1,B2,End] :

Test: days (1,1,1,31,1972) resultat attendu: 30.

Cas: [Start,B1,D1,D2,B3,B5,D3,End] :

Test : days(1,2,1,3,2020) resultat attendu: 29

Cas: [Start,B1,D1,D2,B4,B5,D3,B6,D3,End]

Test : days(1,2,1,3,2021) resultat attendu: 28

Cas: [Start,B1,D1,D2,B4,B5,D3,B6,D3,B6,D3,End]

Test : days(1,1,1,4,2021) resultat attendu: 90 !!!

Cas: [Start,B1,D1,D2,B3,B5,D3,B6,D3,B6,D3,B6,D3,End]

Test : days(1,1,1,5,2021) resultat attendu: 120 ...

Cas pour les annees bisextiles... Ca reste FAISABLE pour AllPath₃(CFG).

- Exo 2:

- Spec:

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pre N ≥ 0          post result = X^N
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definition pre(N,X) ≡ N ≥ 0
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definition post(N,X,r) ≡ r = X^N
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- AllTransitions(CFG) =

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{[Start,B1,D1,End], [Start,B1,D1,D2,B2,B3,D1,End],
 [Start,B1,D1,D2,B3,D1,End] }
```

- Cas [Start, B1, D1, End]:

Execution symbolique:

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	CondChemin	X	N	S	P	result
Start	$N_0 \geq 0$	X_0	N_0	S_0	N_0	result ₀
B1	$N_0 \geq 0$	X_0	N_0	1	1	
D1	$N_0 \geq 0 \wedge = (P \geq 1 [P \mapsto N_0])$	X_0	N_0	1	N_0	result ₀
End	$N_0 \geq 0 \wedge P_0 < 1$	X_0	N_0	1	N_0	1

Condition de chemin:

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$N_0 \geq 0 \wedge N_0 < 1$

- Exo 2:

- Cas [Start, D1, End] (ctd):

Jeu de Test:

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X = 5, N = 0 resultat attendu : 1.

- Execution symbolique:

Execution symbolique:

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	CondChemin	X	N	S	P	result
Start	$N_0 \geq 0$	X_0	N_0	S_0	N_0	$result_0$
B1	$N_0 \geq 0$	X_0	N_0	1	1	$result_0$
D1	$N_0 \geq 0 \wedge (P \geq 1 [P \mapsto N_0])$	X_0	N_0	1	N_0	$result_0$
D2	$N_0 \geq 1 \wedge N_0 \bmod 2 \neq 0$	"	"	"	"	"
B2	"	"	"	X_0	$N_0 - 1$	"
B3	"	"	"	$X_0 * X_0$	$(N_0 - 1) / 2$	"
D1	$" \wedge \Rightarrow (P \geq 1 [P \mapsto (N_0 - 1) / 2])$	"	"	"	"	"
End	$" \wedge (N_0 - 1) / 2 < 1$	"	"	"	"	$X_0 * X_0$

Condition de chemin:

=====

$N_0 \geq 1 \wedge N_0 \bmod 2 \neq 0 \wedge (N_0 - 1) / 2 < 1$

Question : Faisable ? Oui

- Exo 2:
 - Cas [Start, D1, End] (ctd):

Jeu de Test:

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X = 5, N = 0 resultat attendu : 1.

Verdict:

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Est-ce que le programme est correct ? (respecte la post-condition ?)

Non. Un erreur pour X = 5, N = 1.

- Exo 2:

- Cas [Start, B1, D1,D2, B3, D1, End]:

- Execution symbolique:

Execution symbolique:

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	CondChemin	X	N	S	P	result
Start	$N_0 \geq 0$	X_0	N_0	S_0	N_0	result ₀
B1	$N_0 \geq 0$	X_0	N_0	1	1	result ₀
D1	$N_0 \geq 0 \wedge (P \geq 1 [P \mapsto N_0])$	X_0	N_0	1	N_0	result ₀
D2	$N_0 \geq 1 \wedge \neg (N_0 \bmod 2 \neq 0)$	"	"	"	"	"
B3	$N_0 \geq 1 \wedge N_0 \bmod 2 = 0$	"	"	$X_0 * X_0$	$N_0/2$	"
D1	$" \wedge \neg (P \geq 1 [P \mapsto N_0/2])$	"	"	"	"	"
End	$" \wedge N_0/2 < 1$	"	"	"	"	$X_0 * X_0$

Condition de chemin:

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$$N_0 \geq 1 \wedge N_0 \bmod 2 = 0 \wedge N_0/2 < 1$$

Pas faisable.

Jeu de Test:

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existe pas pour ce chemin, etant donne infaisable.

- Jeu de test: