Rapport de stage Analyse de suites d'accords de jazz

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ENS de Lyon, M1 Informatique fondamentale

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Plan

Plan

LZ77 : exemple

Entrée

$\mathtt{I} = ABCABCABD$

Sortie

$(0, 0, A)$, $(0, 0, B)$, $(0, 0, C)$, $(3, 5, D)$

LZ77 : exemple

Entrée

$\mathtt{I} = ABCABCABD$

Étape	**Buffer**									**Entrée** (« Aperçu »)								
0										A	B	C	A	B	C	A	B	D

Sortie

(0,0,A), $(0, 0, B)$, $(0, 0, C)$, $(3, 5, D)$

LZ77 : exemple

Entrée

$\mathtt{I} = ABCABCABD$

Étape	**Buffer**									**Entrée** (« Aperçu »)								
0										A	B	C	A	B	C	A	B	D
1									A	B	C	A	B	C	A	B	D	

Sortie

$(0, 0, A)$, **(0,0,B)**, $(0, 0, C)$, $(3, 5, D)$

LZ77 : exemple

Entrée

$\mathtt{I} = ABCABCABD$

Étape	**Buffer**									**Entrée** (« Aperçu »)								
0										A	B	C	A	B	C	A	B	D
1									A	B	C	A	B	C	A	B	D	
2								A	B	C	A	B	C	A	B	D		

Sortie

$(0, 0, A)$, $(0, 0, B)$, **(0,0,C)**, $(3, 5, D)$

LZ77 : exemple

Entrée

$\mathtt{I} = ABCABCABD$

Étape	**Buffer**									**Entrée** (« Aperçu »)								
0										A	B	C	A	B	C	A	B	D
1									A	B	C	A	B	C	A	B	D	
2								A	B	C	A	B	C	A	B	D		
3							A	B	C	A	B	C	A	B	D			

Sortie

$(0, 0, A)$, $(0, 0, B)$, $(0, 0, C)$, **(3,5,D)**

Input

$\mathtt{I} = ABCABCABD$

Decompression	Output
	$(0, 0, A)$
	$(0, 0, B)$
	$(0, 0, C)$
	$(3, 5, D)$

Input

$\mathtt{I} = ABCABCABD$

Decompression	Output
	(0,0,A)
	$(0, 0, B)$
	$(0, 0, C)$
	$(3, 5, D)$

Input

$\mathtt{I} = ABCABCABD$

Decompression	Output
A	**(0,0,A)**
	$(0, 0, B)$
	$(0, 0, C)$
	$(3, 5, D)$

Input

$\mathtt{I} = ABCABCABD$

Decompression	Output
A	$(0, 0, A)$
	(0,0,B)
	$(0, 0, C)$
	$(3, 5, D)$

Input

$\mathtt{I} = ABCABCABD$

Decompression	Output
A	$(0, 0, A)$
B	**(0,0,B)**
	$(0, 0, C)$
	$(3, 5, D)$

Input

$\mathtt{I} = ABCABCABD$

Decompression	Output
A	$(0, 0, A)$
B	$(0, 0, B)$
	(0,0,C)
	$(3, 5, D)$

Input

$\mathtt{I} = ABCABCABD$

Decompression	Output
A	$(0, 0, A)$
B	$(0, 0, B)$
C	**(0,0,C)**
	$(3, 5, D)$

Input

$\mathtt{I} = ABCABCABD$

Decompression	Output
A	$(0, 0, A)$
B	$(0, 0, B)$
C	$(0, 0, C)$
	(3,5,D)

Input

$\mathtt{I} = ABCABCABD$

Decompression	Output
A	$(0, 0, A)$
B	$(0, 0, B)$
C	$(0, 0, C)$
A	**(3,5,D)**
B	
C	

Input

$\mathtt{I} = ABCABCABD$

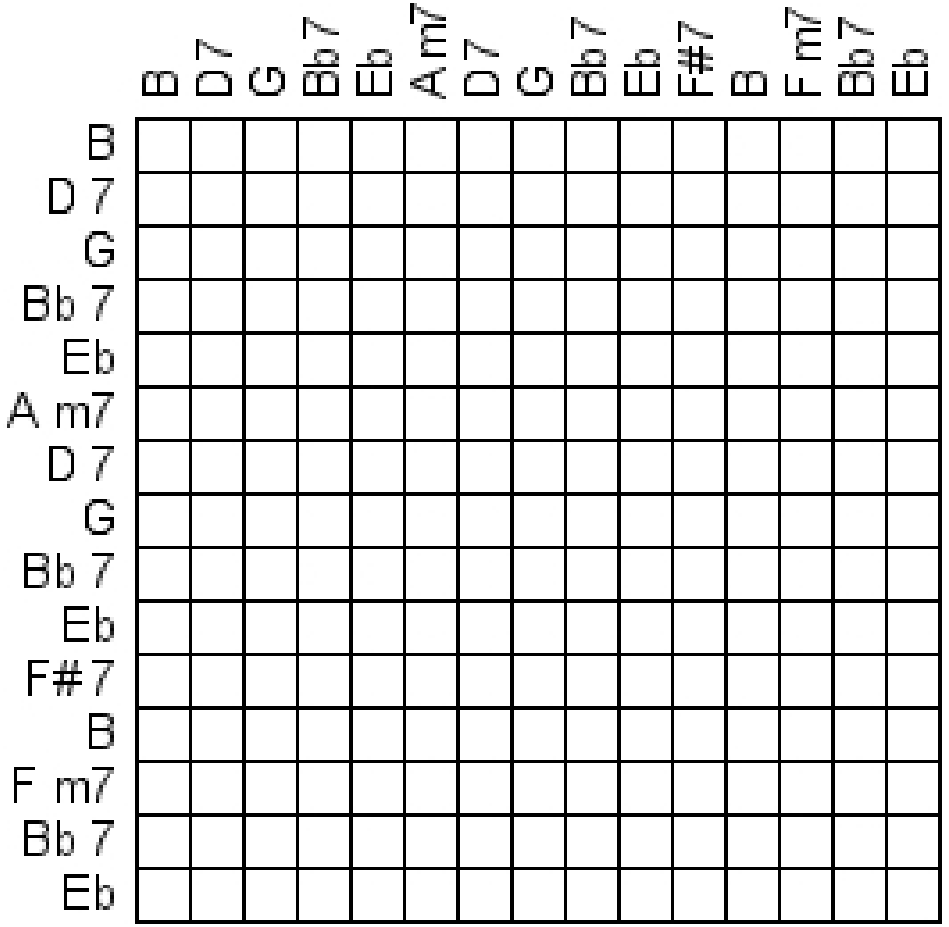
Decompression	Output
A	$(0, 0, A)$
B	$(0, 0, B)$
C	$(0, 0, C)$
A	**(3,5,D)**
B	
C	
A	
B	

Input

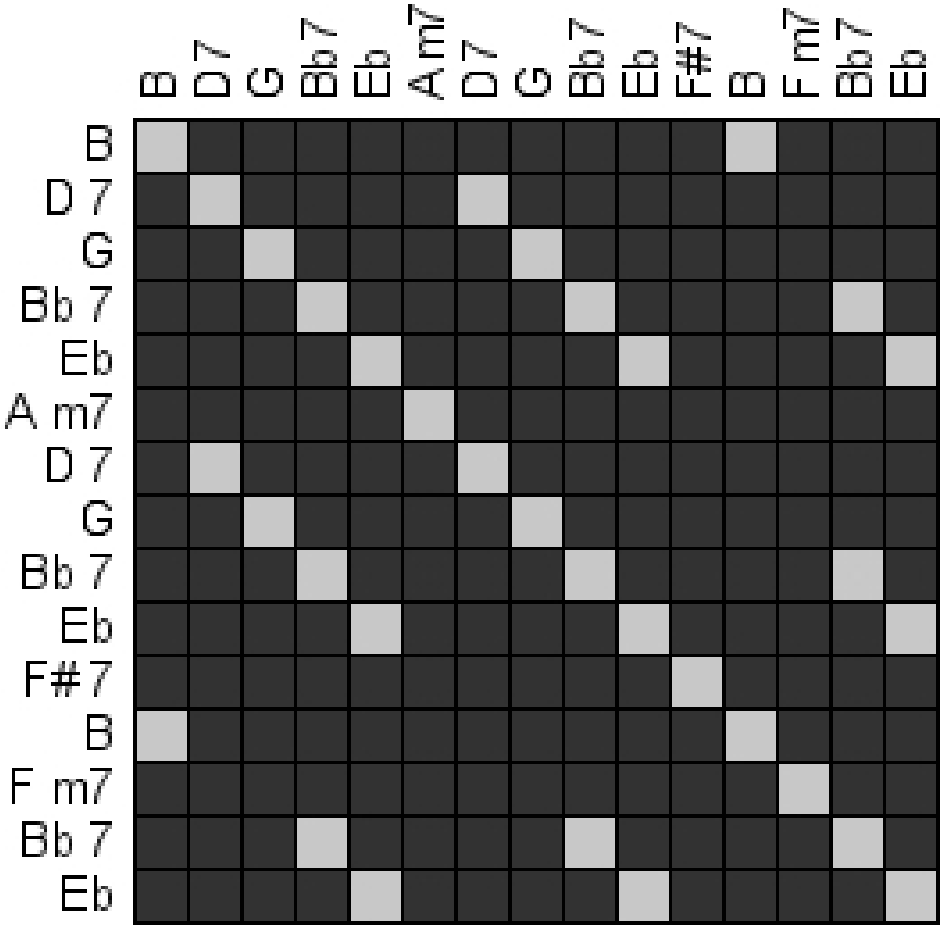
$\mathtt{I} = ABCABCABD$

Decompression	Output
A	$(0, 0, A)$
B	$(0, 0, B)$
C	$(0, 0, C)$
A	**(3,5,D)**
B	
C	
A	
B	
D	

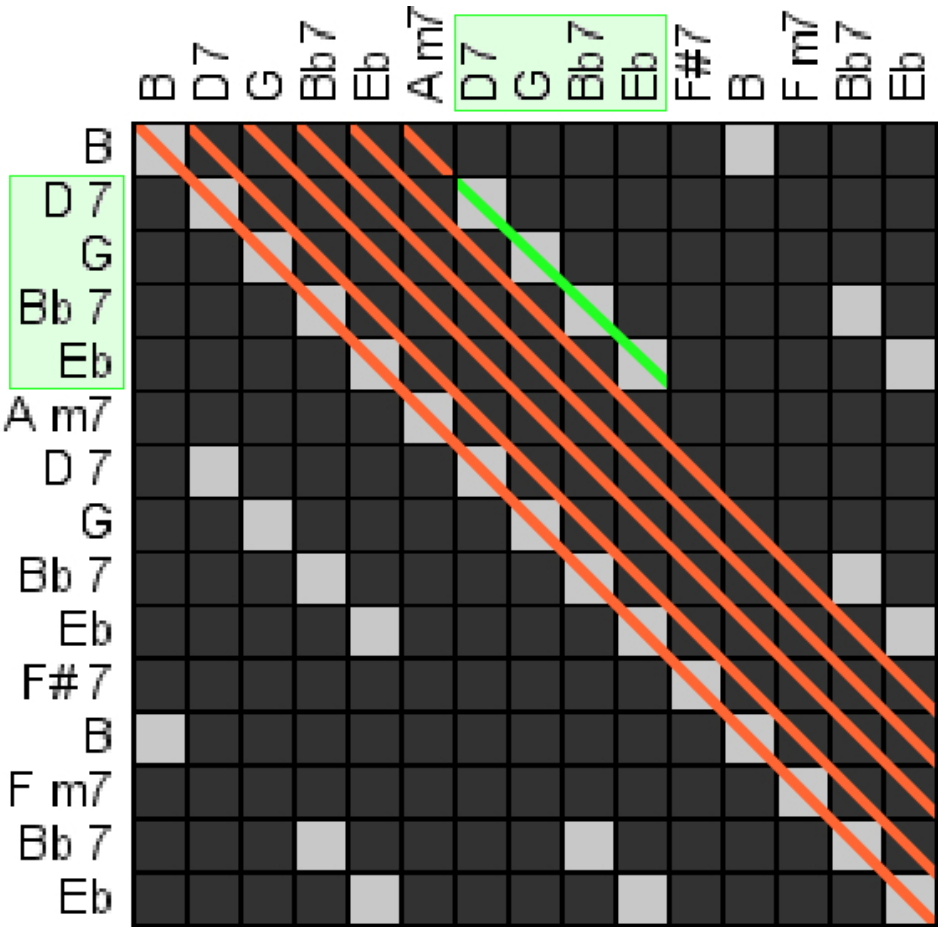
Diagonal patterns (1)



Diagonal patterns (1)



Diagonal patterns (1)



Diagonal patterns (2)

Step 1 Identify the patterns

Step 2 Find a (small) cover

Diagonal patterns (3)

Input

$\mathtt{I} = B; D7; G; B\flat 7; E\flat; Am7; D7; G; B\flat 7; E\flat; F\#7; B; Fm7; B\flat 7; E\flat$

Diagonal patterns (3)

Input

$\mathtt{I} = B; D7; G; B\flat 7; E\flat; Am7; D7; G; B\flat 7; E\flat; F\#7; B; Fm7; B\flat 7; E\flat$

Patterns

- B — $\{0; 11\}$;
- $B\flat 7;\ E\flat$ — $\{3; 8; 13\}$;
- $D7;\ G;\ B\flat 7;\ E\flat$ — $\{1; 6\}$;

Diagonal patterns (3)

Input

$\mathtt{I} = B; D7; G; B\flat 7; E\flat; Am7; D7; G; B\flat 7; E\flat; F\#7; B; Fm7; B\flat 7; E\flat$

Patterns

- B — $\{0; 11\}$;
- $B\flat 7$; $E\flat$ — $\{3; 8; 13\}$;
- $D7$; G; $B\flat 7$; $E\flat$ — $\{1; 6\}$;
- $D7$ — $\{1; 6\}$, G — $\{2; 7\}$ . . .

Diagonal patterns (3)

Input

$\mathtt{I} = B; D7; G; B\flat 7; E\flat; Am7; D7; G; B\flat 7; E\flat; F\#7; B; Fm7; B\flat 7; E\flat$

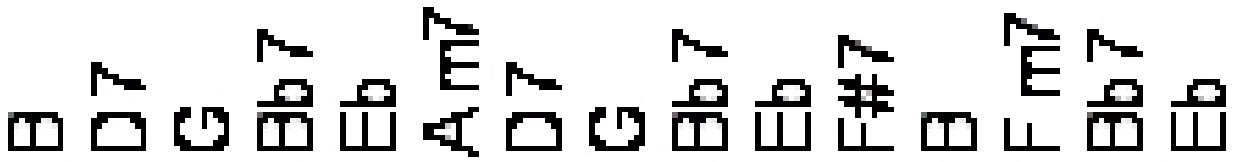
Patterns

- B — $\{0; 11\}$;
- $B\flat 7$; $E\flat$ — $\{3; 8; 13\}$;
- $D7$; G; $B\flat 7$; $E\flat$ — $\{1; 6\}$;
- $D7$ — $\{1; 6\}$, G — $\{2; 7\}\ldots$

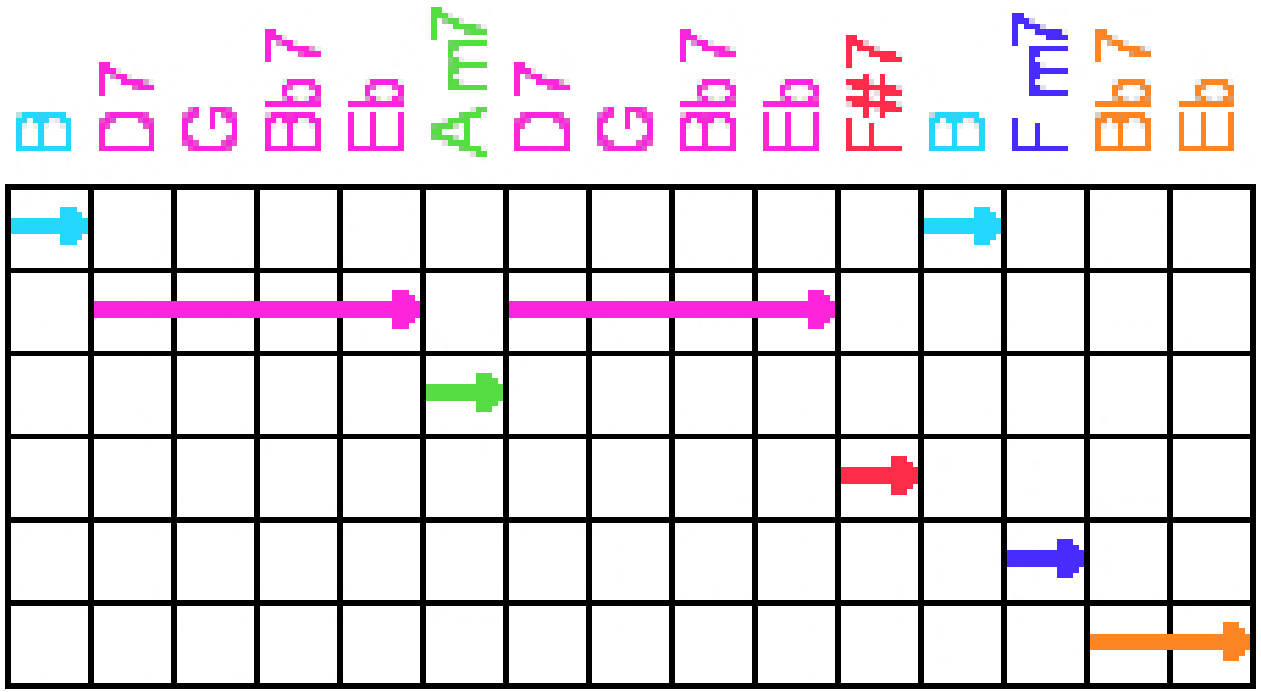
Output

- B — $\{0; 11\}$;
- $B\flat 7$; $E\flat$ — $\{13\}$;
- $D7$; G; $B\flat 7$; $E\flat$ — $\{1; 6\}$;
- $Am7$ — $\{5\}$, $F\#7$ — $\{10\}$, $Fm7$ — $\{12\}$

Diagonal patterns (4)



Diagonal patterns (4)



Plan

The magical ingredient

$$C = C'$$

The magical ingredient

$$C = C'$$
$$\downarrow$$
$$C \sim C'$$

All measures

- root note equivalence ;
- transposition equivalence ;
- PCS-Prime equivalence ;
- the F1-score ;
- Isaacson's similarity index ;
- Lewin's measure ;
- Morris' measure ;
- Rahn's measure ;
- Teitelbaum's measure.

Thresholds

Plan

Evaluation

Compression factor

Recovery factor

Evaluation

Compression factor

$$\frac{|\text{Input}|}{|\text{Output}|}$$

Recovery factor

$$\frac{|\{i \mid \text{DECOMPRESS}(\text{COMPRESS}(\text{Input}))[i]=\text{Input}[i]\}|}{|\text{Input}|}$$

Comparison between measures (1)

« Similarity measures are similar. »

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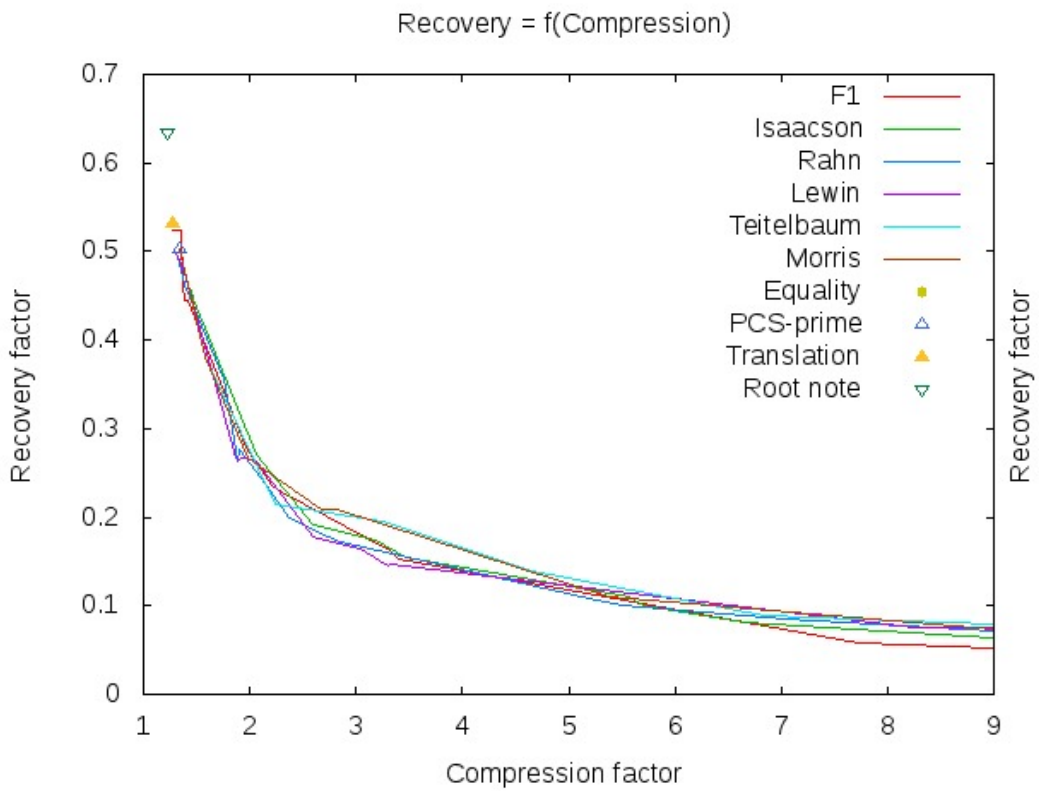
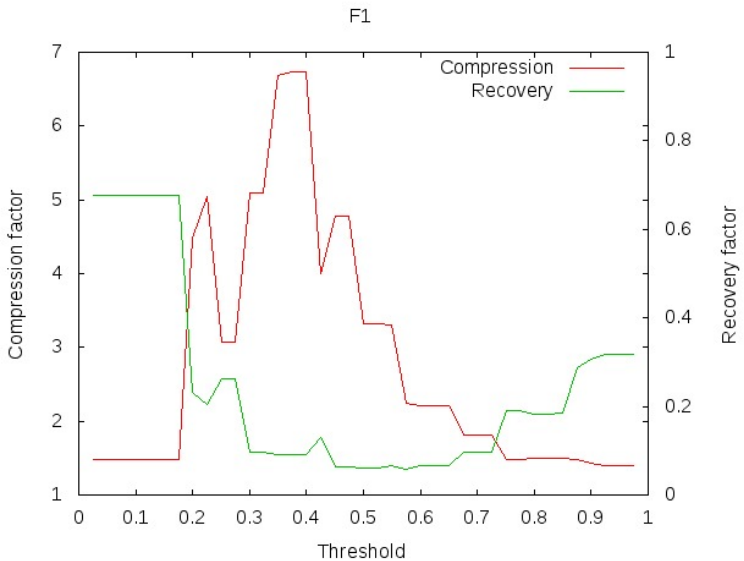
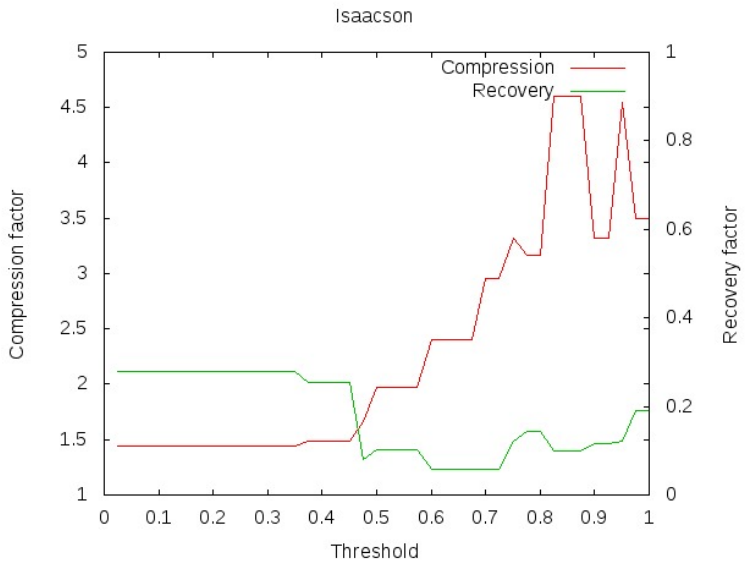
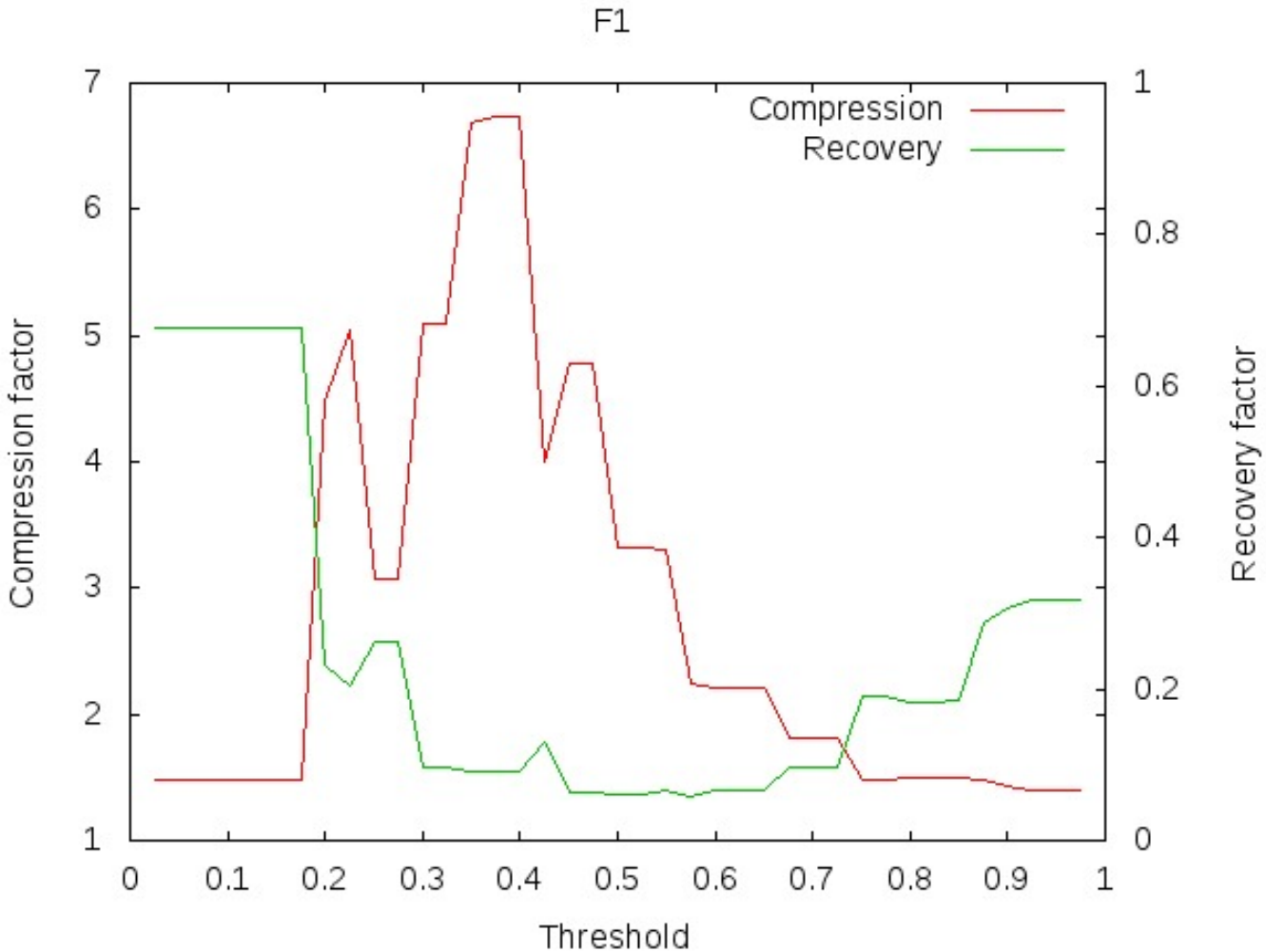


Comparison between measures (2)





Comparison between measures (2)



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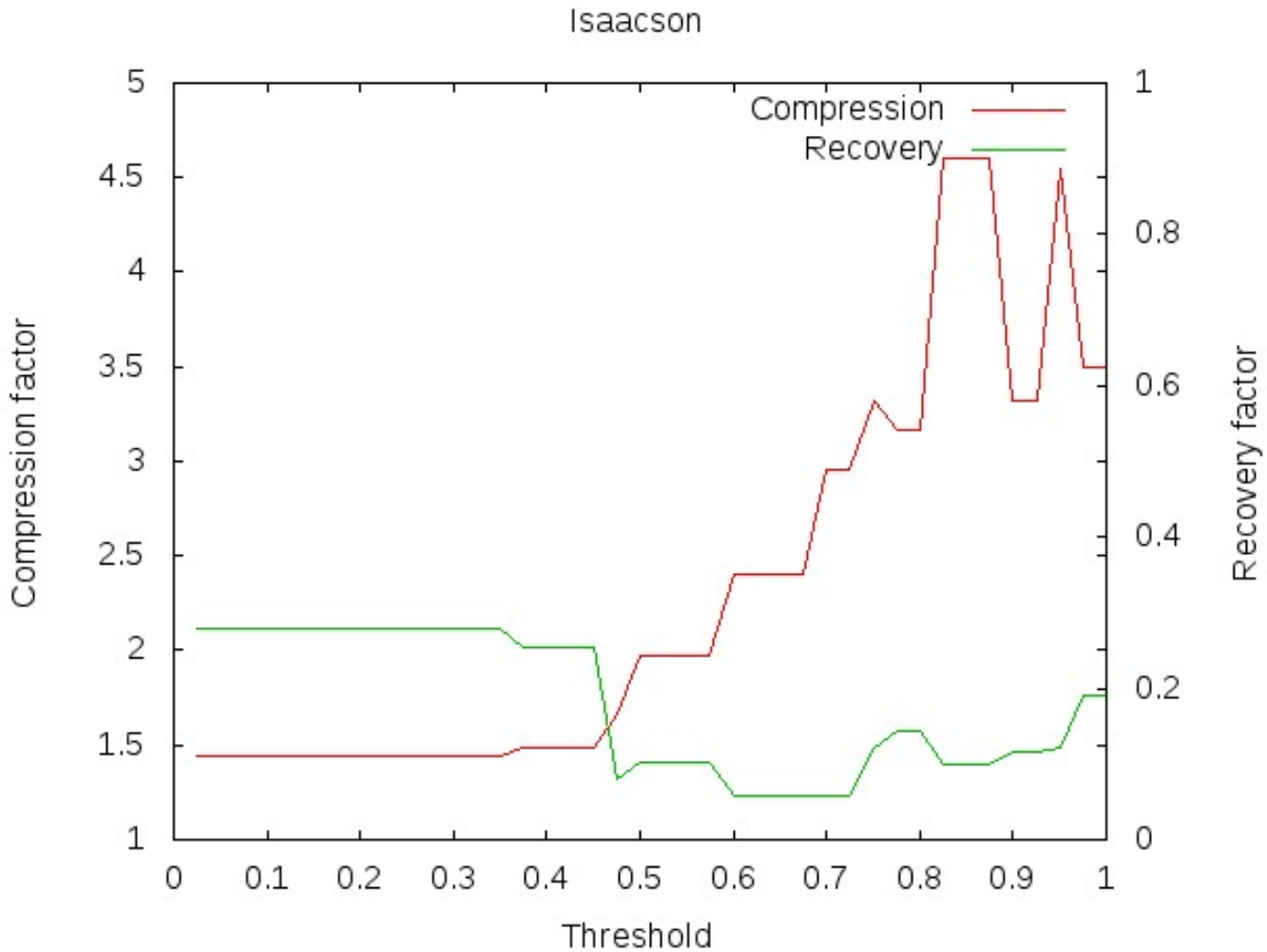
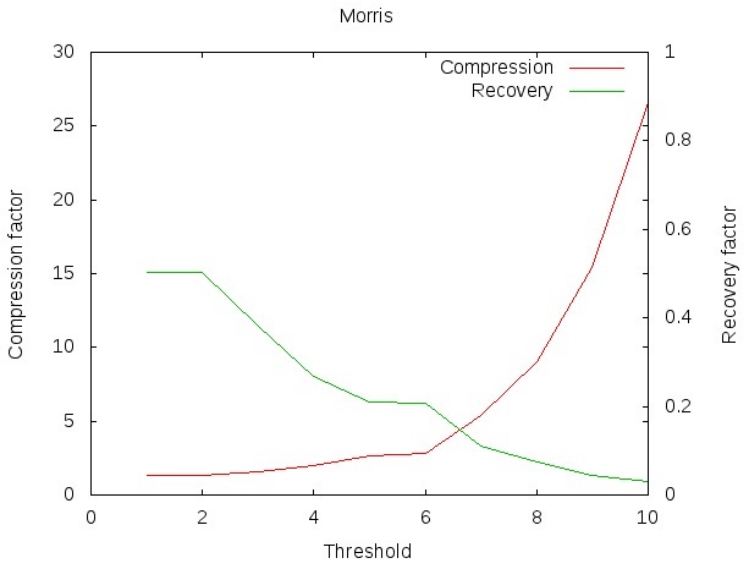
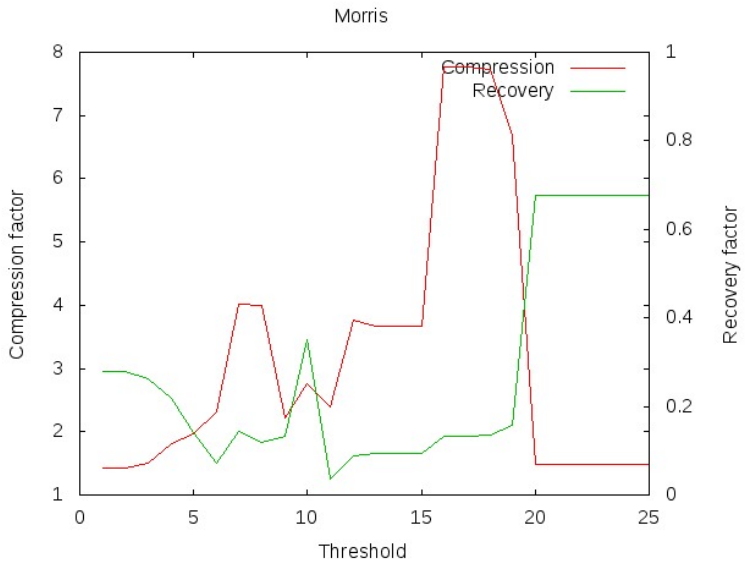


Comparison between algorithms (1)





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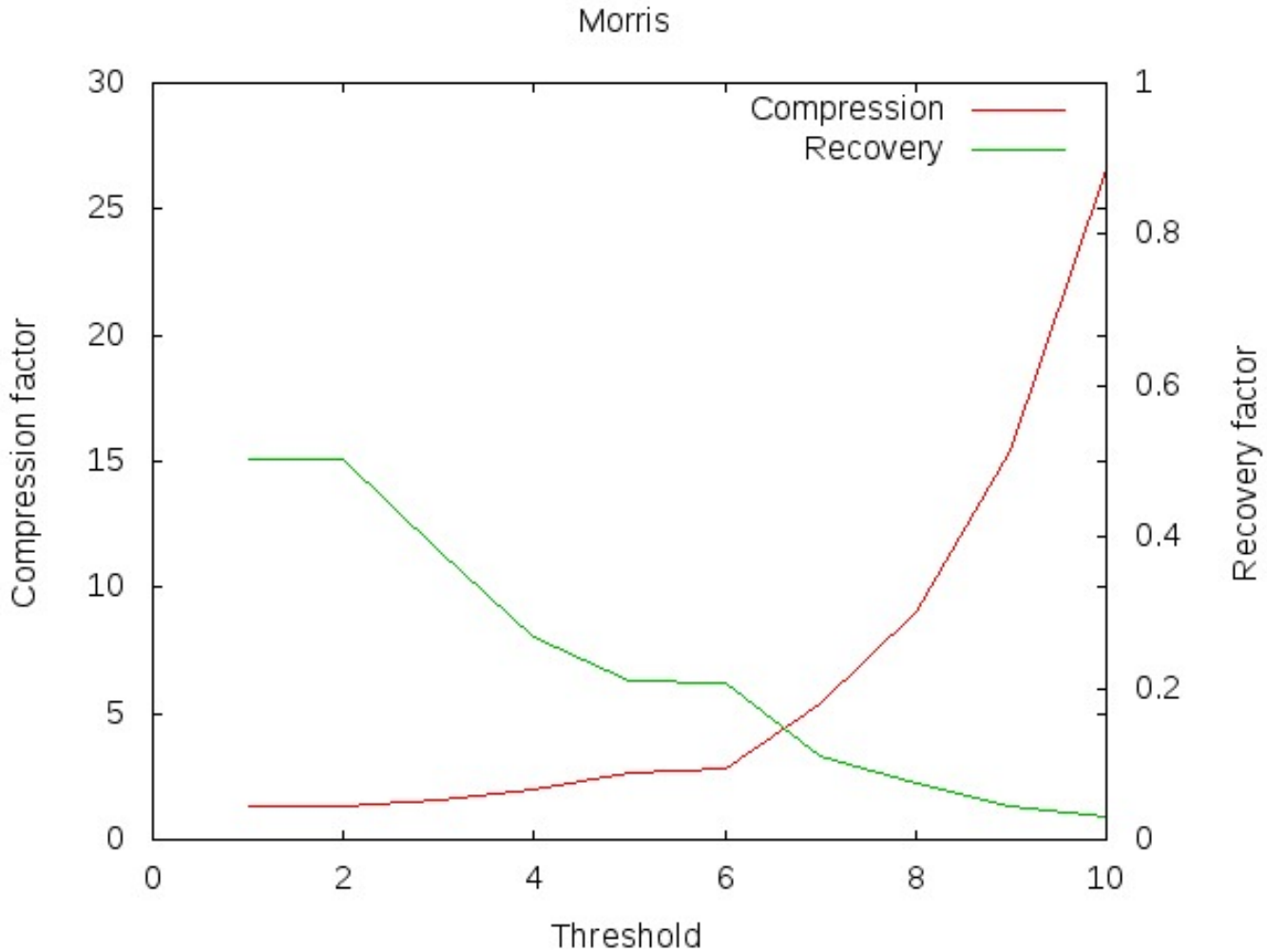

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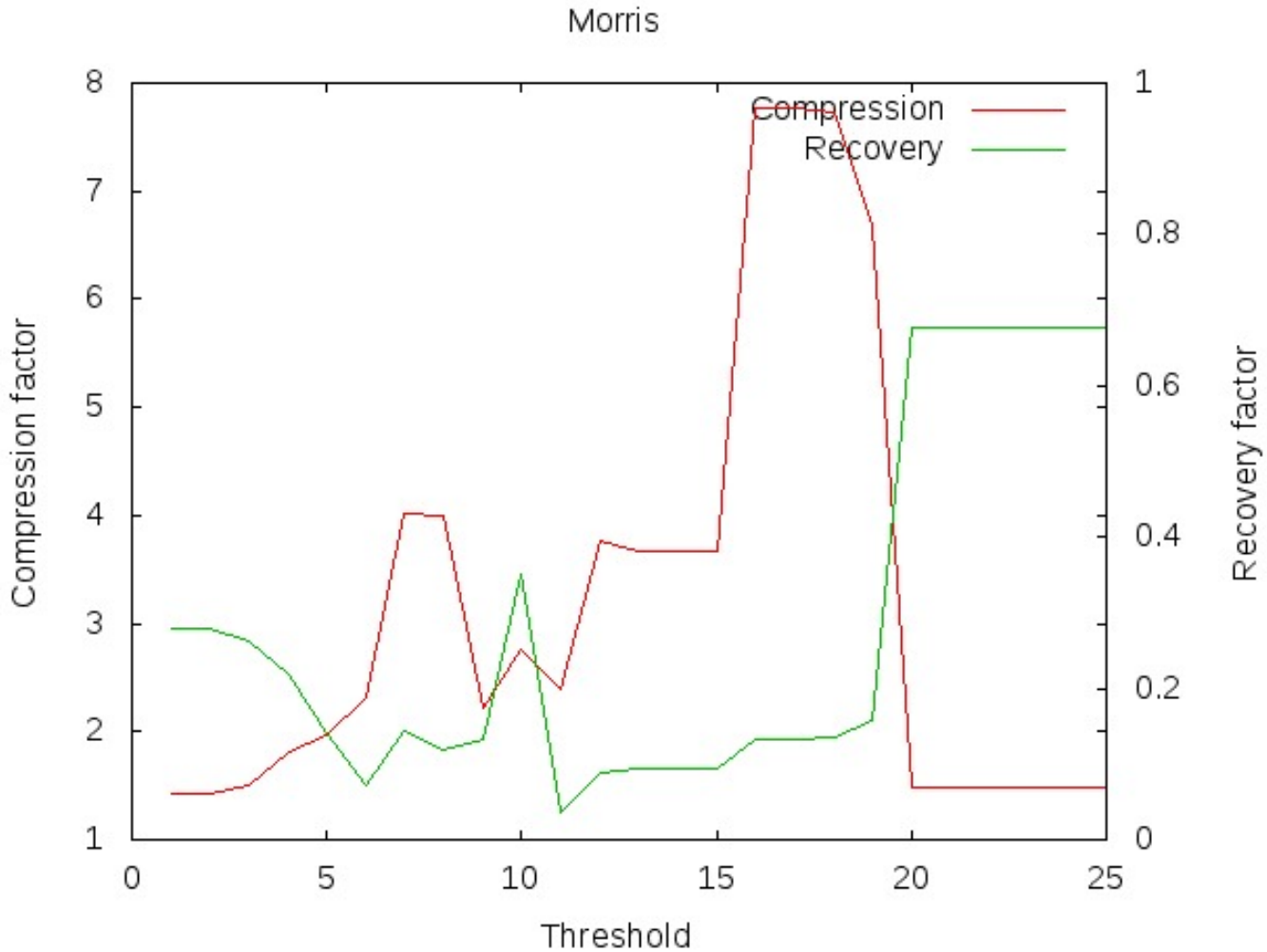
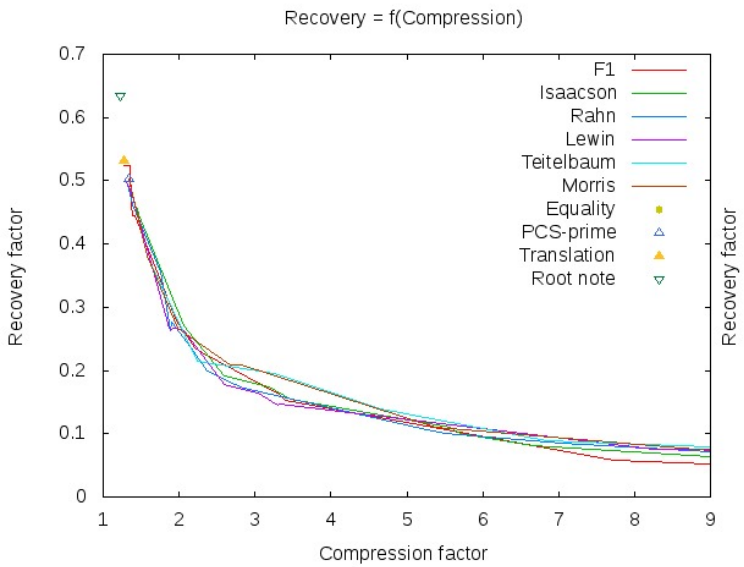
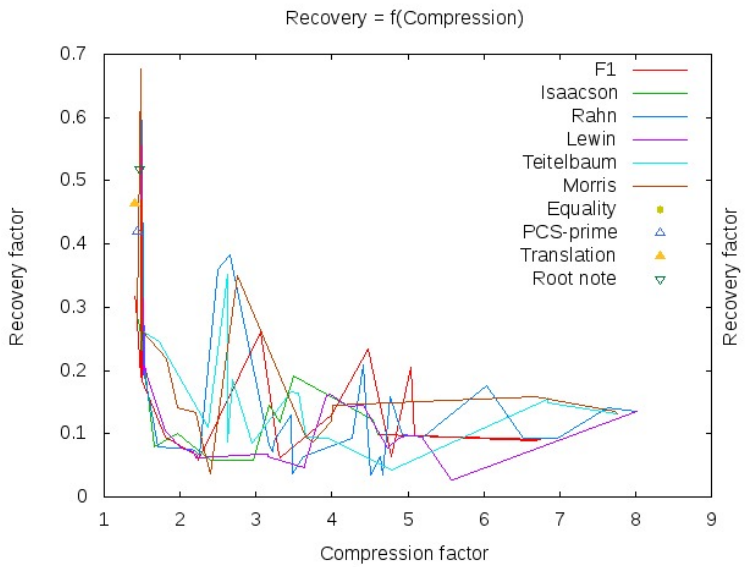
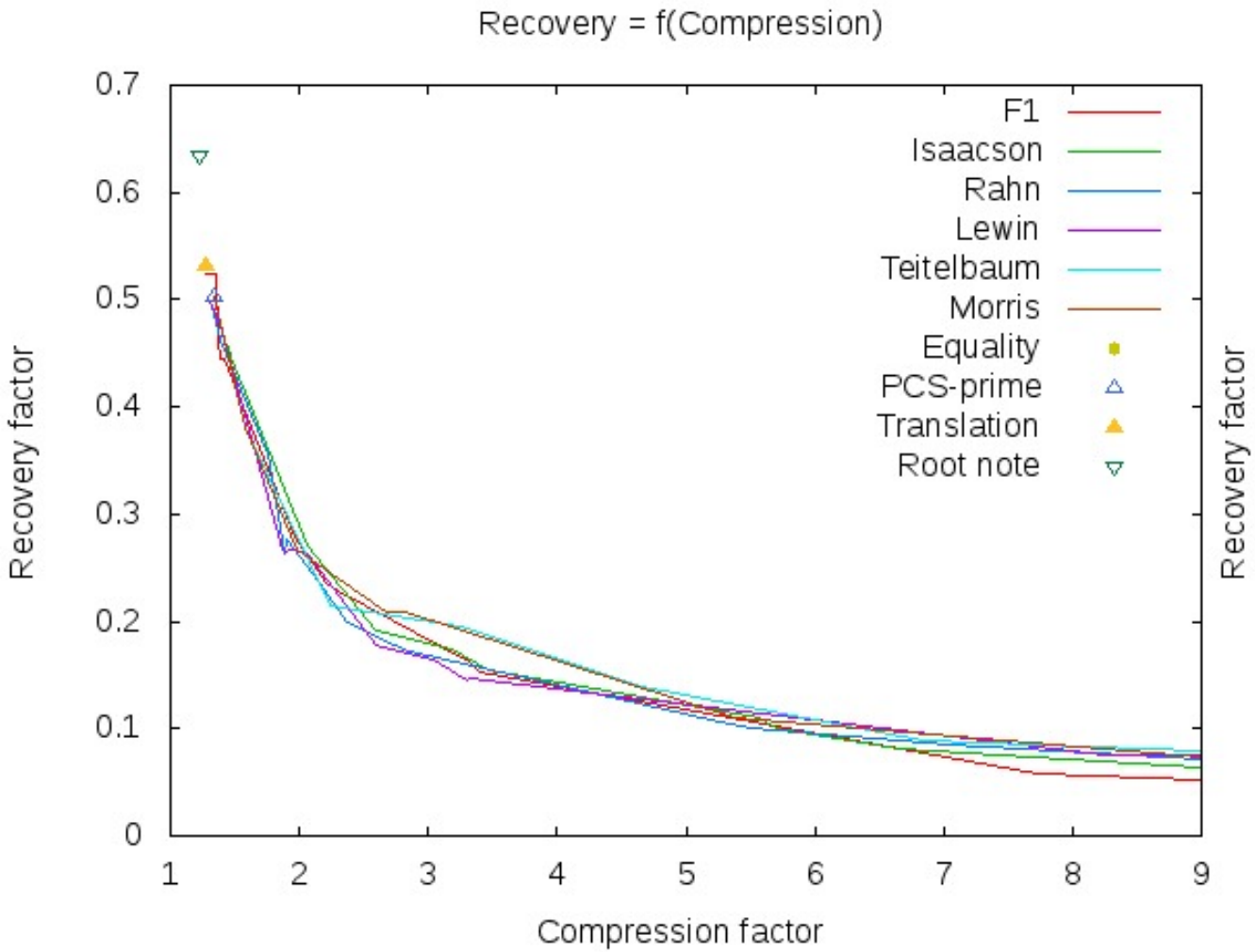


Comparison between algorithms (2)

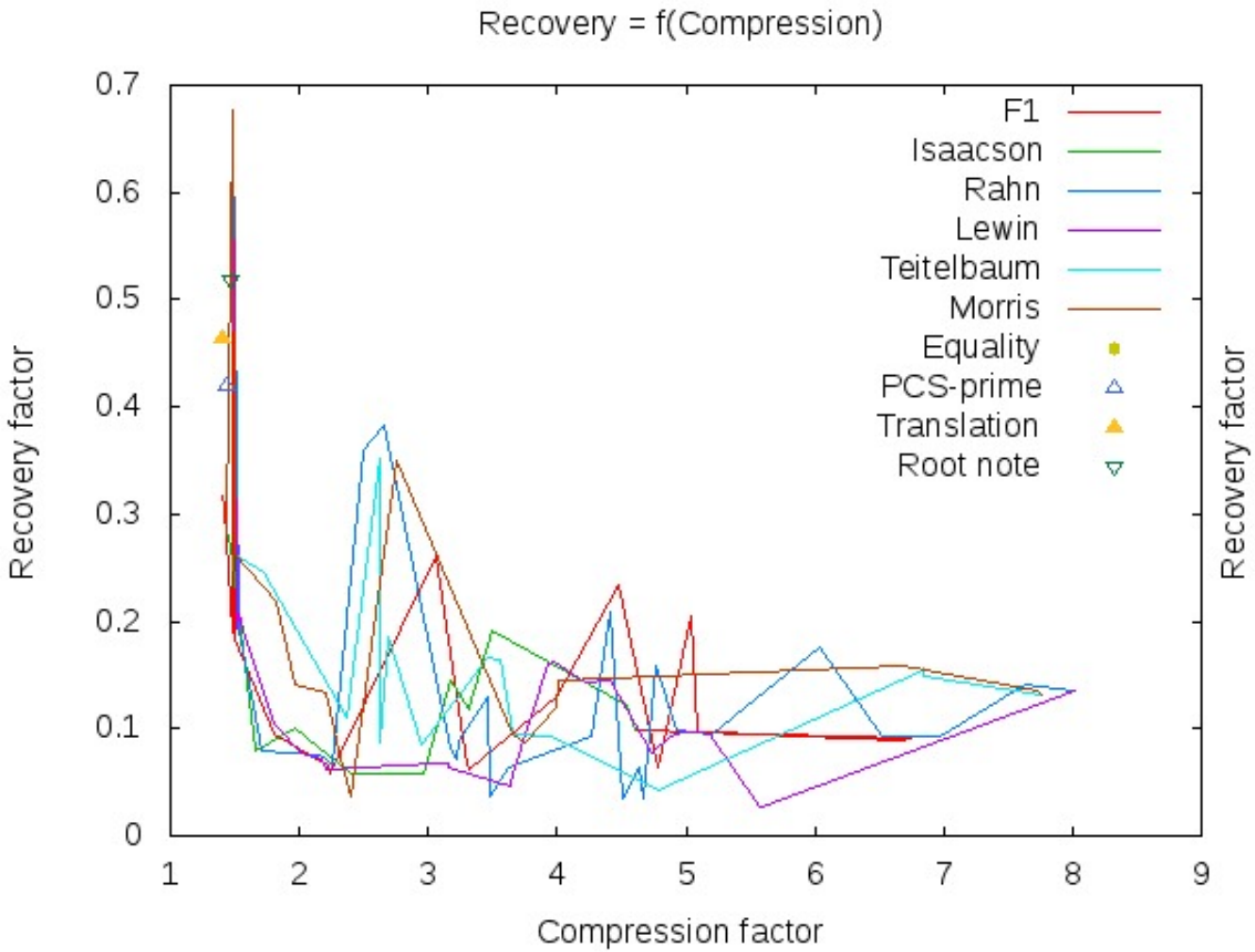




Comparison between algorithms (2)



Comparison between algorithms (2)




That's all Folks!