

Show Name	Start Year	Creator	Stream Site	URL	Show Seasons	Stream Seasons
The Wire	2002	Simon	HBO	hbo.com	1-5	1-5
Babylon 5	1993	Straczynski	Prime	es.com	5	1-5
Never Have I Ever	2020	Kelley	Netflix	netflix.com	1-2	1-2
Babylon 5	1993	Straczynski	Hulu	hulu.com	1-5	1-5
The Wire	2002	Simon	Prime	es.com	1-5	1-1
Jeopardy	1980	A	netflix	netflix.com	1-26	1-10

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The Wire	2002	Simon	HBO	HBO.com	1-5	1-5
Babylon 5	1993	Straczynski	Prime	23.com	1-5	1-5
Never Have I Ever	2020	Kaling	Netflix	netflix.com	1-2	1-2
Babylon 5	1993	Straczynski	Hulu	hulu.com	1-5	1-5
The Wire	2002	Simon	Prime	23.com	1-5	1-1
Jeopardy	1980	A	netflix	netflix.com	1-20	1-10

Decomposition (example)

R1 (ShowName, StartYear, Creator, ShowSeason)

4 tuples total	The Wire	2002	Simon	1-5
	Babylon 5	1993	Straczynski	1-5
	Never Have I Ever	2020	Kaling	1-2
	Jeopardy	1980	A	1-20

R2 (StreamSite, URL, StreamSeasons)

6 tuples total for the above relation

Is this decomposition lossless? **No!**

For this example

$$R1 * R2 \neq R$$

$$4 \times 6 \quad \downarrow$$

24 tuples 6 tuples

Lossy decomposition

$$R(A, B, C) \quad F = \{A \rightarrow B\}$$

A	B	C
a	b ₁	c
a ₂	b	c

 $R_1(A, C)$

A	C
a	c
a ₂	c

 $R_2(B, C)$

B	C
b ₁	c
b	c

$$R_1 \bowtie R_2 \neq R$$

 $R_3(A, B)$

A	B
a	b ₁
a ₂	b

 $R_4(A, C)$

A	C
a	c
a ₂	c

 $R_3 \times R_4$

A	B	C
a	b ₁	c
a ₂	b	c

 $R_1 \bowtie R_2 \neq R$

A	B	C
a	b	c
a	b ₁	c
a ₂	b	c
a ₂	b ₁	c

↑
lossless decomposition

↑
lossy decomposition