

#1 Fundamentals of Data Management

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Credit Task 4.2.1

Dependency	Possible (Yes/No)	Why/Why Not?
$A \rightarrow B$	No	$A1 = B1, B2$
$A \rightarrow C$	No	$A1 = C1, C3$
$A \rightarrow D$	No	$A1 = D3, D2$
$B \rightarrow A$	No	$B2 = A1, A2$
$B \rightarrow C$	Yes	$B1 = C1, B2 = C2, B3 = C5$
$B \rightarrow D$	No	$B2 = D2, D4$
$C \rightarrow A$	No	$C3 = A1, A2$
$C \rightarrow B$	Yes	$C1 = B1, C3 = B2, C5 = B3$
$C \rightarrow D$	No	$C3 = D2, D4$
$\{A, B\} \rightarrow C$	Yes	$A1B1 = C1, A1B2 = C3, A2B2 = C3, A3B3 = C5$ -- $A1B1$ (Composite) are 1..*
$\{A, B\} \rightarrow D$	Yes	$A1B1 = D3...$
$\{B, C\} \rightarrow A$	No	$B2C3 = A1, A2$
$\{B, C\} \rightarrow D$	No	$B2C3 = D2, D4$
$\{C, D\} \rightarrow A$	Yes	All combinations have unique combinations $C1D3 = A1, C3D2 = A1, C3D4 = A2, C5D4 = A3$
$\{C, D\} \rightarrow B$	Yes	\wedge (all keys do not result into more than 1 result)
$\{A, C\} \rightarrow B$	Yes	\wedge (hence the 1..* relationship)
$\{A, C\} \rightarrow D$	Yes	\wedge

Interpretation: $B \rightarrow A$ means that A depends on B, or:

- B = Student ID
- A = Student Name
 - Student ID \rightarrow Student Name

To understand the why/why not:

- **Student ID 111 \rightarrow Student Name John Doe**
 - This is good
- **Student ID 111 \rightarrow Student Name John Doe, Jane Doe**
 - This is bad
- **Student ID 111, 113 \rightarrow Student Name John Doe**
 - Maybe there are 2 people named John Doe
 - This is OK

Hence:

- $B2 = C1, B3 = C2$
 - Good, every primary key has only one result.
- $B2 = C1, C2$
 - This is **bad**, primary key must only respond to one result.
- $B2 = C1, B3 = C1$
 - Also good, every primary key has only one result, even if it's the same as another