# Module 3 Assessment ZB

## Instructions:

Consider the relation R (A, B, C, D, E) with FDs = {AB→→right arrowCD, D→→right arrowE, A→→right arrowC, B→→right arrowD}. Does the relation violate the 3NF/BCNF? If it does, show the steps to remove the violations. Present your answers as: 1) normalized relation schemas and 2) normalized ERD diagram.

## Does the relation violate the 3NF/BCNF

Yes, R is not in BCNF.

For closure:

* **AB+**: AB → CD;
* AB+ = A,B,C,D.
* From D → E,
* AB+ = {A,B,C,D,E}.
* **AB is a candidate key**.

Check BCNF condition:

BCNF requires: For every FD X → Y, X must be a superkey.

|  |  |
| --- | --- |
| AB → CD: LHS = AB, which is a key | satisfies BCNF |
| D → E: LHS = D. D+ = {D,E}, not a key. | violates BCNF |
| A → C: LHS = A. A+ = {A,C}, not a key. | violates BCNF |
| B → D: LHS = B. B+ = {B,D,E}, not full R | violates BCNF |

Therefore, R is not in BCNF.

## Final BCNF relations

* R1(D,E)
* R3(A,C)
* R5(B,D)
* R6(A,B)

Therefore:

(A,B) --A--> (A,C)

|

B

v

(B,D) --D--> (D,E)

## ERD

A diagram of a computer

AI-generated content may be incorrect.