

## Practice 1: 3NF and BCNF

Consider a relation Stocks(B, O, I, S, Q, D), whose attributes may be thought of informally as broker, office (of the broker), investor, stock quantity (of the stock owned by the investor), and dividend (of the stock). Let the set of FDs for Stocks be

FDs $=\{S \rightarrow D, I \rightarrow B, I S \rightarrow Q, B \rightarrow O\}$

1. Verify that the given set of FDs is a minimal basis

## Practice 1: 3NF and BCNF (2)

Stocks(B, O, I, S, Q, D)
$F D s=\{S \rightarrow D, I \rightarrow B, I S \rightarrow Q, B \rightarrow O\}$
2. Use 3NF, decompose the given Stocks relation into proper relations

## Practice 1: 3NF and BCNF (3)

Stocks(B, O, I, S, Q, D)
$F D s=\{S \rightarrow D, I \rightarrow B, I S \rightarrow Q, B \rightarrow O\}$
3. Show that the decomposed relations are in 3NF

## Practice 1: 3NF and BCNF (4)

## Practice 2: 3NF

Consider the following relation and functional dependencies R(A, B, C, D)
FDs $=\{C \rightarrow A, C \rightarrow D, C \rightarrow C, A B \rightarrow C\}$

1. Decompose the given relation $R(A, B, C, D)$ using $3 N F$
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Stocks(B, O, I, S, Q, D)
FDs = {S }->\textrm{D},\textrm{I}->\textrm{B},\textrm{IS}->\textrm{Q},\textrm{B}->\textrm{O}
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4. Are the decomposed relations in BCNF?
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## Practice 2: 3NF (2)

2. Discuss to show that the decomposed relations are in 3NF

## Practice 3: BCNF

Consider the following relation and functional dependencies $R(A, B, C, D)$
$F D s=\{C \rightarrow A, C \rightarrow D, C \rightarrow C, A B \rightarrow C\}$

1. Decompose the given relation $R(A, B, C, D)$ using $B C N F$

| Practice 3: BCNF (2) |
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| 2. Discuss to show that the decomposed relations are in BCNF |
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## Practice 4: 3NF (2)

2. Discuss to show that the decomposed relations are in 3NF

## Practice 4: 3NF

Consider the following relation and functional dependencies R(A, B, C, D)
FDs $=\{A \rightarrow A B C, C \rightarrow D, A \rightarrow C, D \rightarrow D\}$

1. Decompose the given relation $R(A, B, C, D)$ using $3 N F$

## Practice 5: BCNF

Consider the following relation and functional dependencies $R(A, B, C, D)$
$F D s=\{A \rightarrow A B C, C \rightarrow D, A \rightarrow C, D \rightarrow D\}$

1. Decompose the given relation $R(A, B, C, D)$ using $B C N F$

| Practice 5: BCNF (2) |
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| 2. Discuss to show that the decomposed relations are in BCNF |
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## Practice 6: BCNF

Given $R(A, B, C, D, E)$
FDs $=\{B \rightarrow D E, C \rightarrow A, A \rightarrow B C, D \rightarrow E\}$
Convert the relation into BCNF

## Practice 7: BCNF

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Given R(A,B,C,D,E)
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``` Convert the relation into BCNF
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## Practice 8: 3NF

Given $R(A, B, C, D, E)$
FDs $=\{A \rightarrow C E, A \rightarrow B, B \rightarrow D, D \rightarrow C D, C \rightarrow E\}$ Convert the relation into BCNF

