



IT214 Lab 8 Report
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1 Database of Online Book Store

1. Functional Dependencies :-

$ISBN \rightarrow Title$
 $ISBN \rightarrow AuthorName$
 $ISBN \rightarrow Amount$
 $ISBN \rightarrow Currency$
 $ISBN \rightarrow PubID$
 $ISBN \rightarrow PublisherName$
 $PubID \rightarrow PublisherName$
 $RISBN \rightarrow ISBN_Original$
 $RISBN \rightarrow RAmount$
 $RISBN \rightarrow RCurrency$
 $RISBN \rightarrow RPubID$
 $RISBN \rightarrow PublisherName$
 $RISBN \rightarrow Title$
 $RISBN \rightarrow AuthorName$

F_{min}

$ISBN \rightarrow Title$
 $ISBN \rightarrow AuthorName$
 $ISBN \rightarrow Amount$
 $ISBN \rightarrow Currency$
 $ISBN \rightarrow PubID$
 $PubID \rightarrow PublisherName$
 $RISBN \rightarrow ISBN_Original$
 $RISBN \rightarrow RAmount$
 $RISBN \rightarrow RCurrency$
 $RISBN \rightarrow RPubID$

2. FD Set

(a) Book (ISBN, Title, Amount, Currency, PubID)

$ISBN \rightarrow \{Title, Amount, Currecny, PubID\}$

(b) BookAuthor (ISBN, AuthorName)

$ISBN \rightarrow \{AuthorName\}$

(c) Publisher (PubID, PublisherName)

$PubID \rightarrow \{PublisherName\}$

- (d) Reprint (RISBN, RAmount, RCurrency, RPubID, ISBN_Original)

$$RISBN \rightarrow \{RAmount, RCurrency, RPubID, ISBN_Original\}$$

3. Key from all projected FD set on the relation

- (a) Book (ISBN, Title, Amount, Currency, PubID)

$$ISBN^+ \rightarrow \{ISBN, Title, Amount, Currecny, PubID\}$$

$ISBN^+$ has all the attributes. So ISBN is the key of this relation.

- (b) BookAuthor (ISBN, AuthorName)

$$ISBN^+ \rightarrow \{ISBN, AuthorName\}$$

$ISBN^+$ has all the attributes. So ISBN is the key of this relation.

- (c) Publisher (PubID, PublisherName)

$$PubID^+ \rightarrow \{PubID, PublisherName\}$$

$PubID^+$ has all the attributes. So PubID is the key of this relation.

- (d) Reprint (RISBN, RAmount, RCurrency, RPubID, ISBN_Original)

$$RISBN^+ \rightarrow \{RISBN, RAmount, RCurrency, RPubID, ISBN_Original\}$$

$RISBN^+$ has all the attributes. So RISBN is the key of this relation.

4. BCNF or not ?

- (a) Book (ISBN, Title, Amount, Currency, PubID)

All FD's have key i.e. ISBN on the left side. So this relation is in BCNF

- (b) BookAuthor (ISBN, AuthorName)

All FD's have key i.e. ISBN on the left side. So this relation is in BCNF

- (c) Publisher (PubID, PublisherName)

All FD's have key i.e. PubID on the left side. So this relation is in BCNF

(d) Reprint (RISBN, RAmount, RCurrency, RPubID, ISBN_Original)

All FD's have key i.e. RISBN on the left side. So this relation is in BCNF

2 Database of Students doing Group Project

1. Functional Dependencies :-

$SID \rightarrow SName$
 $SID \rightarrow GroupID$
 $SID \rightarrow ProjectTitle$
 $SID \rightarrow Leader_ID$
 $SID \rightarrow TA_ID$
 $SID \rightarrow TA_Name$
 $GroupID \rightarrow ProjectTitle$
 $GroupID \rightarrow Leader_ID$
 $GroupID \rightarrow SName$
 $GroupID \rightarrow TA_ID$
 $GroupID \rightarrow TA_Name$
 $TA_ID \rightarrow TA_Name$
 $\{SID, ParamName, StageName\} \rightarrow StudentMarks$
 $\{GroupID, ParamName, StageName\} \rightarrow GroupMarks$
 $\{ParamName, StageName\} \rightarrow MaxMarks$

F_{min}

$SID \rightarrow SName$
 $SID \rightarrow GroupID$
 $GroupID \rightarrow ProjectTitle$
 $GroupID \rightarrow Leader_ID$
 $GroupID \rightarrow TA_ID$
 $TA_ID \rightarrow TA_Name$
 $\{SID, ParamName, StageName\} \rightarrow StudentMarks$
 $\{GroupID, ParamName, StageName\} \rightarrow GroupMarks$
 $\{ParamName, StageName\} \rightarrow MaxMarks$

2. FD Set

(a) Student (SID, Sname, GroupID)

$SID \rightarrow \{Sname, GroupID\}$

(b) Group (GroupID, ProjectTitle, Leader_ID, TA_ID)

$GroupID \rightarrow \{ProjectTitle, Leader_ID, TA_ID\}$

(c) TA (TA_ID, TA_Name)

$TA_ID \rightarrow \{TA_Name\}$

(d) Individual_Evaluation (SID, ParamName, StageName, StudentMarks)

$$\{SID, ParamName, StageName\} \rightarrow \{StudentMarks\}$$

(e) Group_Evaluation (GroupID, ParamName, StageName, GroupMarks)

$$\{GroupID, ParamName, StageName\} \rightarrow \{GroupMarks\}$$

(f) Param_Stage (ParamName, StageName, MaxMarks)

$$\{ParamName, StageName\} \rightarrow \{MaxMarks\}$$

3. Key from all projected FD set on the relation

(a) Student (SID, Sname, GroupID)

$$SID^+ \rightarrow \{SID, Sname, GroupID\}$$

SID^+ has all the attributes. So SID is the key of this relation.

(b) Group (GroupID, ProjectTitle, Leader_ID, TA_ID)

$$GroupID^+ \rightarrow \{GroupID, ProjectTitle, Leader_ID, TA_ID\}$$

$GroupID^+$ has all the attributes. So GroupID is the key of this relation.

(c) TA (TA_ID, TA_Name)

$$TA_ID^+ \rightarrow \{TA_ID, TA_Name\}$$

TA_ID^+ has all the attributes. So TA_ID is the key of this relation.

(d) Individual_Evaluation (SID, ParamName, StageName, StudentMarks)

$$\{SID, ParamName, StageName\}^+ \rightarrow \{SID, ParamName, StageName, StudentMarks\}$$

$\{SID, ParamName, StageName\}^+$ has all the attributes.
So $\{SID, ParamName, StageName\}$ is the key of this relation.

(e) Group_Evaluation (GroupID, ParamName, StageName, GroupMarks)

$$\{GroupID, ParamName, StageName\}^+ \rightarrow \{GroupID, ParamName, StageName, GroupMarks\}$$

$\{GroupID, ParamName, StageName\}^+$ has all the attributes.
So $\{GroupID, ParamName, StageName\}$ is the key of this relation.

(f) Param_Stage (ParamName, StageName, MaxMarks)

$\{ParamName, StageName\}^+ \rightarrow \{ParamName, StageName, MaxMarks\}$

$\{ParamName, StageName\}^+$ has all the attributes. So $\{ParamName, StageName\}$ is the key of this relation.

4. BCNF or not ?

(a) Student (SID, Sname, GroupID)

All FD's have key i.e. SID on the left side. So this relation is in BCNF

(b) Group (GroupID, ProjectTitle, Leader_ID, TA_ID)

All FD's have key i.e. GroupID on the left side. So this relation is in BCNF

(c) TA (TA_ID, TA_Name)

All FD's have key i.e. TA_ID on the left side. So this relation is in BCNF

(d) Individual_Evaluation (SID, ParamName, StageName, StudentMarks)

All FD's have key i.e. $\{SID, ParamName, StageName\}$ on the left side. So this relation is in BCNF

(e) Group_Evaluation (GroupID, ParamName, StageName, GroupMarks)

All FD's have key i.e. $\{GroupID, ParamName, StageName\}$ on the left side. So this relation is in BCNF

(f) Param_Stage (ParamName, StageName, MaxMarks)

All FD's have key i.e. $\{ParamName, StageName\}$ on the left side. So this relation is in BCNF