

ROSE S JOSE

B190839CS

DBMS ASSIGNMENT 5

First Normal Form(1NF)

A relation is in 1NF if it does not contain composite, multi-valued attributes or their compositions. Attribute values permitted by 1NF are single atomic (or indivisible) values.

User

<u>User Id</u>	Username	Company Name	Manager Id	Address	Mobile No	User login Id	Server Id
1	karthik	Google	4	ABC Villa, Kochi, 678987	8987654345, 9878906758	1	3
2	kenney	Amazon	3	XYZ Villa, Calicut, 698765	9751234512	2	3
3	maria	Amazon	4	GFG Home, Delhi, 320987	8765435465	3	3
4	mia	Netflix	2	LMN House, Mumbai, 109876	8765456786	4	3
5	lola	Google	1	Lint House, Hyderabad, 543567	7654389078	5	3

Here, Address is a composite attribute and Mobile No is multivariable attribute.

To make the relation 1NF, the composite variable can be removed from the relation and each composite values of the attribute can be added to relation as different attributes. The multivariable attribute can be removed and made into a new relation.

User

<u>User Id</u>	Username	Company Name	Manager Id	House Name	City	PIN	User Login Id	Server Id
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Address

+ Options																
			<div>▼ Userid Username CompanyName ManagerId HouseName UserLoginId ServerId Age City PIN</div>													
<input type="checkbox"/>		Edit		Copy		Delete	1	karthik	Google	4	ABC Villa	1	3	20	Kochi	678901
<input type="checkbox"/>		Edit		Copy		Delete	2	kenny	Amazon	3	XYZ Villa	2	3	25	Calicut	698765
<input type="checkbox"/>		Edit		Copy		Delete	3	maria	Amazon	4	GFG House	3	3	27	Delhi	320987
<input type="checkbox"/>		Edit		Copy		Delete	4	mia	Netflix	2	LMN House	4	3	18	Mumbai	109876
<input type="checkbox"/>		Edit		Copy		Delete	5	Iola	Google	1	Lint House	5	3	19	Hyderabad	543201

Mobile No

<u>User Id</u>	<u>Mobile No</u>
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Options			Userid	MobileNo
<input type="checkbox"/>	Edit	Copy	Delete	1 8987654345
<input type="checkbox"/>	Edit	Copy	Delete	1 9878906758
<input type="checkbox"/>	Edit	Copy	Delete	2 9751234512
<input type="checkbox"/>	Edit	Copy	Delete	3 8765435465
<input type="checkbox"/>	Edit	Copy	Delete	4 8765456786
<input type="checkbox"/>	Edit	Copy	Delete	5 7654389078

All the other tables are in 1NF

User Login

<u>User login Id</u>	Username	Initiation date
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Manager

<u>Manager Id</u>	Manager Name	Username	Server Id
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File

<u>Hash value</u>	File Name	Last access date	Server Id
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Server

<u>Server Id</u>	Server name
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Has Access

<u>User Id</u>	<u>Hash value</u>	File Type	Request type	Access type
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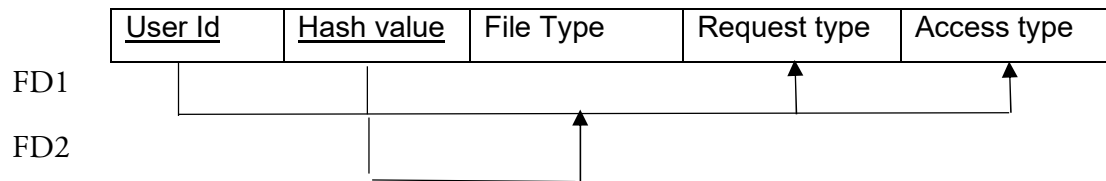
Renewal

<u>User Login Id</u>	<u>Manager Id</u>	Authorization type
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Second Normal Form(2NF)

A relation schema R is in 2NF if every nonprime attribute A in R is fully functionally dependent on the primary key of R or if every nonprime attribute A in R is not partially dependent on any key of R.

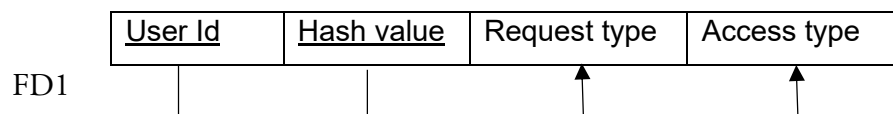
Has Access



<u>User Id</u>	<u>Hash Value</u>	File Type	Request type	Access type
1	2	Text	Insert	Accepted
2	1	Word	Delete	Accepted
3	4	Excel	Insert	Rejected
4	3	Text	Insert	Accepted
5	5	pdf	Delete	Rejected

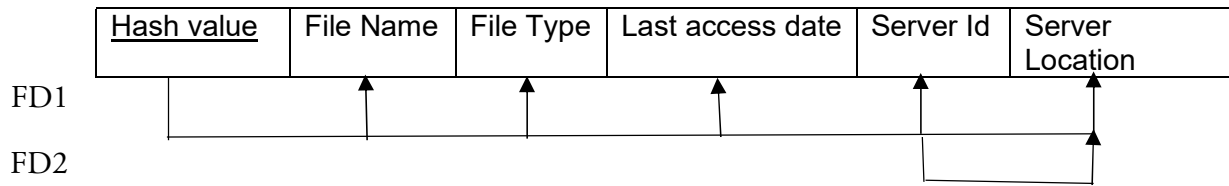
Here FD2 violates 2NF since File Type which is a non-prime attribute is partially dependent on the primary key {User Id, Hash value}. To rectify it, File Type can be removed from the relation and can be added to relation File.

Has Access



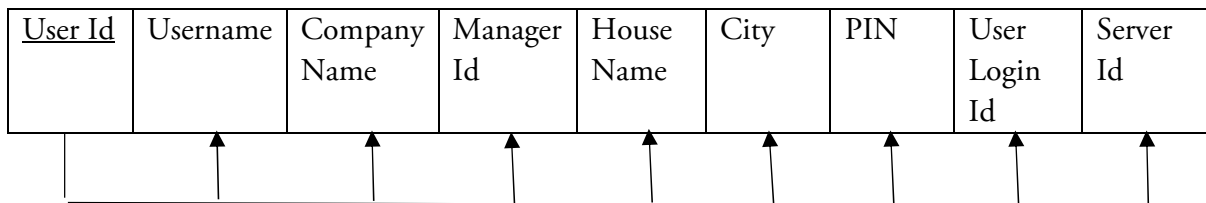
<u>User Id</u>	<u>Hash Value</u>	Request type	Access type
1	2	Insert	Accepted
2	1	Delete	Accepted
3	4	Insert	Rejected
4	3	Insert	Accepted
5	5	Delete	Rejected

File

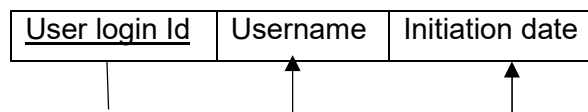


<u>Hash Value</u>	File Name	File Type	Last access date	Server Id	Server Location
1	DBMS	Word	2021-09-01	2	Bengaluru
2	Object oriented systems	Text	2021-08-07	2	Bengaluru
3	Operating Systems	Text	2021-07-10	2	Bengaluru
4	Theory of Computation	Excel	2021-08-25	2	Bengaluru
5	Engineering Economics	pdf	2021-07-29	2	Bengaluru

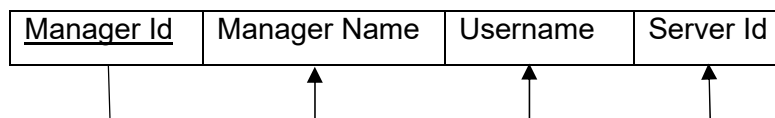
User



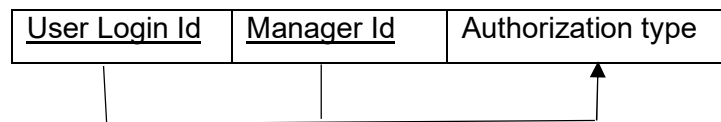
User Login



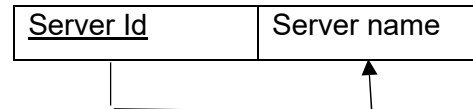
Manager



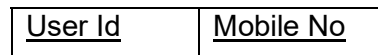
Renewal



Server



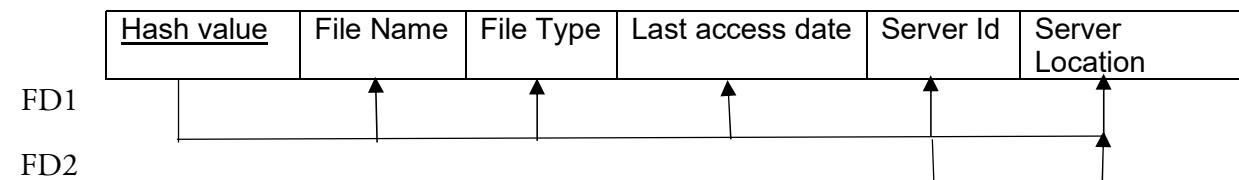
Mobile No



Third Normal Form(3NF)

A relation schema R is in 3NF if it satisfies 2NF and no nonprime attribute of R is transitively dependent on the primary key or a relation schema R is in 3NF if, whenever a nontrivial functional dependency $X \rightarrow A$ holds in R, either (a) X is a super key of R, or (b) A is a prime attribute of R.

File



<u>Hash Value</u>	File Name	File Type	Last access date	Server Id	Server Location
1	DBMS	Text	2021-09-01	2	Bengaluru
2	Object oriented systems	Word	2021-08-07	2	Bengaluru
3	Operating Systems	Excel	2021-07-10	2	Bengaluru
4	Theory of Computation	Text	2021-08-25	2	Bengaluru
5	Engineering Economics	pdf	2021-07-29	2	Bengaluru

Here FD2 violates 3NF because there is a functional dependency between Server Id and Server Location which is a transitive dependency HashValue -> Server Id -> Server Location. Server Id is neither a super key nor Server Location is a prime attribute. Therefore to make the relation 3NF, the attribute Server Location can be removed from the relation file and can be added to the relation server.

Server

<u>Server Id</u>	Server name	Server Location
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<u>Server Id</u>	Server name	Server Location
1	Localhost	Hyderabad
2	Main	Bengalure
3	Userserver	Delhi
4	Managerserver	Delhi
5	local	Hyderabad

File

<u>Hash value</u>	File Name	File Type	Last access date	Server Id
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<u>Hash Value</u>	File Name	File Type	Last access date	Server Id
1	DBMS	Text	2021-09-01	2
2	Object oriented systems	Word	2021-08-07	2
3	Operating Systems	Excel	2021-07-10	2
4	Theory of Computation	Text	2021-08-25	2
5	Engineering Economics	pdf	2021-07-29	2

User

<u>User Id</u>	Username	Company Name	Manager Id	House Name	City	PIN	User Login Id	Server Id
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User Login

<u>User login Id</u>	Username	Initiation date
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Manager

<u>Manager Id</u>	Manager Name	Username	Server Id
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Renewal

<u>User Login Id</u>	<u>Manager Id</u>	Authorization type
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Mobile No

<u>User Id</u>	<u>Mobile No</u>
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Has Access

<u>User Id</u>	<u>Hash value</u>	Request type	Access type
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