



## Group Exercises

### Standard Operating Procedure (SOP)

#### Introduction:

Students are needed to be empowered to explore subject in conducting group activities which enhances to improve and utilize teamwork and communication with reduced stress. All students can learn from each other at this point by presenting results. Teacher gives the topic and puts the topic in discussion forums of students to discuss and summarize. Students then split into small groups. In this way, students can be given support through this activity to achieve higher grades, learn at a deeper level, retain information longer, acquire greater communication and teamwork skills, and gain a better understanding of the environment in which they can be able to work as professionals.

#### ACTIVE LEARNING

<b>Name of the Faculty:</b> Dr.S.Suhasini	<b>Designation:</b> Associate Professor	<b>Subject:</b> Database Management Systems
<b>Year/ Semester:</b> II/II	<b>Section:</b> II-A	<b>Topic:</b> Database design
<b>Name of the activity:</b> Group Activity	<b>Date:</b> 22-06-2022	<b>No. of students attended:</b> 68

#### Objective of the activity:

- Eliminate redundant data
- Make access to data easier for user
- Store the organization's data.
- Present that data in ways that are useful to the organization.

#### Execution Plan:

##### Time management: Class time: 50mins

- Forming student groups (8-10 students) in 4 categories : 5 mins
  - Group1 : Outline the Conceptual model
  - Group 2 : Design ER diagram
  - Group 3 : Outline the steps of normalization
  - Group 4 : Apply 1NF,2NF,3NF and BCNF
- Demonstrations by each group (1,2,3,4) : 40mins
- Course coordinator summary : 5mins
- Class of sixty students is best suited for the activity. All students in every group should be able to demonstrate the topic in any dimension.

### Expected Outcomes:

The students can be able to

- Analyze the conceptual model to design ER diagram.
- Understand the three levels of database system architecture with their mappings.
- Understand process and need of normalization
- Summarize normal forms and its applicability

### Assessment of the effectiveness of the activity

Group Id	Number of students	Student RollNo	Assessment before activity (Taken Ass2)	Assessment after activity (Taken Sess2) ** 12 converted to 10**	Group Score Before (Max:10)	Group Score After (Max:10)	Impact (Place a tick and state the % of impact)				
							Negative chance	No chance	Improvement	%	Group %
1	06	208W1A1204	7	7	8.6	9.1		✓		I : 100%	05% Improvement after activity
		208W1A1205	9	10					✓		
		208W1A1207	9.5	10					✓		
		208W1A1208	9.5	9.5				✓			
		208W1A1209	8.5	9.5					✓		
		208W1A1210	8.5	9					✓		
							00	02	04		
2	06	208W1A1211	8	9.5	9.2	9.33			✓	I : 83.2% NC:16.6%	1.3% Improvement after activity
		208W1A1215	10	9			✓				
		208W1A1216	9.5	9.5				✓			
		208W1A1218	9.5	9.5				✓			
		208W1A1219	9.5	9.5				✓			
		208W1A1221	9	9				✓			
							01	04	01		
3	06	208W1A1229	7.5	10	8.75	9.25			✓	I : 50% NC : 50%	05% Improvement after activity
		208W1A1232	8	10					✓		
		208W1A1235	7.5	8					✓		
		208W1A1236	10	9.5			✓				
		208W1A1237	10	9			✓				
		208W1A1238	9.5	9			✓				

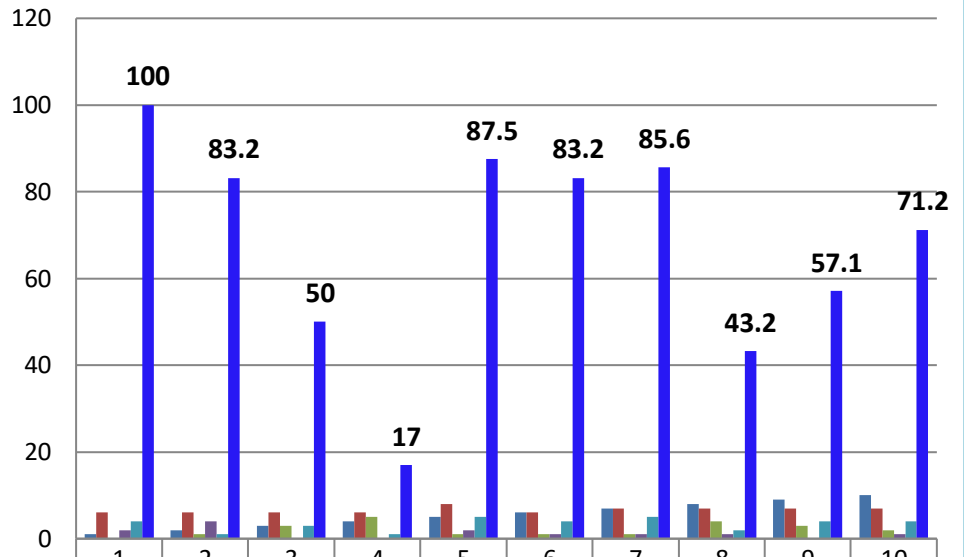
							03	00	03		
4	06	208W1A1240	9	7.5	9.5	8.6	✓			I : 16.6% NC : 83.3%	No improvement
		208W1A1244	8.5	9					✓		
		208W1A1245	10	8.5			✓				
		208W1A1250	9.5	8.5			✓				
		208W1A1251	10	9.5			✓				
		208W1A1254	10	9			✓				
							05	00	01		
5	08	208W1A1255	9.5	9.5	8.75	9.62		✓		I : 87.5% NC:12.5%	09% Improvement after activity
		208W1A1256	8.5	9.5					✓		
		208W1A1259	10	10				✓			
		208W1A1262	9.5	10					✓		
		208W1A1263	9	8			✓				
		218W5A1203	7.5	10					✓		
		218W5A1205	7.5	10					✓		
		218W5A1206	8.5	10					✓		
Boys							01	02	05		
6	06	208W1A1201	7	8.5	7	8			✓	I : 83.2% NC : 16.6%	10% Improvement after activity
		208W1A1203	5.5	4			✓				
		208W1A1206	7	8					✓		
		208W1A1212	6	9.5					✓		
		208W1A1213	8	9.5					✓		
		218W5A1202	9	9				✓			
							01	01	04		
7	07	208W1A1214	7.5	7	6.9	8.1	✓			I : 85.6% NC : 14.2%	12% Improvement after activity
		208W1A1217	9	9.5					✓		
		208W1A1220	6.5	9.5					✓		
		208W1A1222	6.5	8					✓		
		208W1A1223	7	9					✓		
		208W1A1224	7	7				✓			
		208W1A1265	5	7					✓		

							01	01	05		
8	07	208W1A1225	10	9.5	8	8.1	✓			I : 43.2% NC:57 %	01% Improvem ent after activity
		208W1A1226	8	9					✓		
		208W1A1227	8.5	8			✓				
		208W1A1228	9	8			✓				
		208W1A1230	6.5	7.5					✓		
		208W1A1231	8	7.5			✓				
		208W1A1264	7	7				✓			
							04	01	02		
9	07	208W1A1233	7	8	8.1	8.3			✓	I : 57.1% NC : 43%	02% Improvem ent after activity
		208W1A1234	8	8.5					✓		
		208W1A1239	9.5	7.5			✓				
		208W1A1241	8	9					✓		
		208W1A1242	6	9					✓		
		208W1A1243	8.5	8			✓				
		208W1A1261	10	8			✓				
							03	00	04		
10	07	208W1A1246	9.5	9	8.3	8.57	✓			I : 71.2% NC : 28.5%	03% Improvem ent after activity
		208W1A1248	9	9				✓			
		208W1A1249	7.5	9					✓		
		208W1A1252	8.5	6			✓				
		208W1A1253	8	8.5					✓		
		208W1A1258	8	8.5					✓		
		208W1A1260	8	10					✓		
							02	01	04		

Group Id	No of students involved in activity	No of students with Negative change	No of students without change	No of students with Improvement	Group Score Before Activity	Group Score After Activity	Group Impact (%)
1	06	00	02	04	8.6	9.1	100

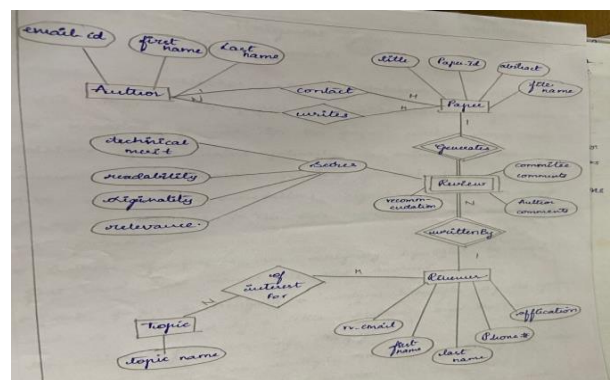
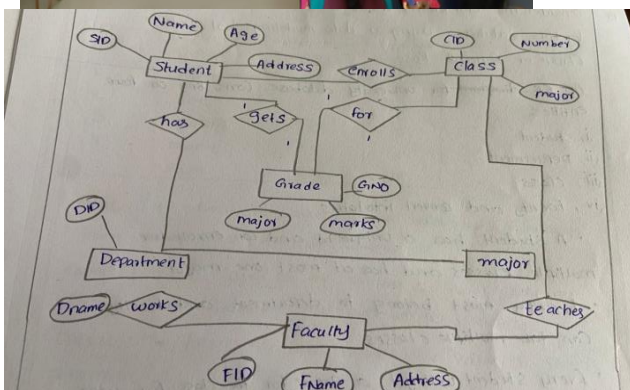
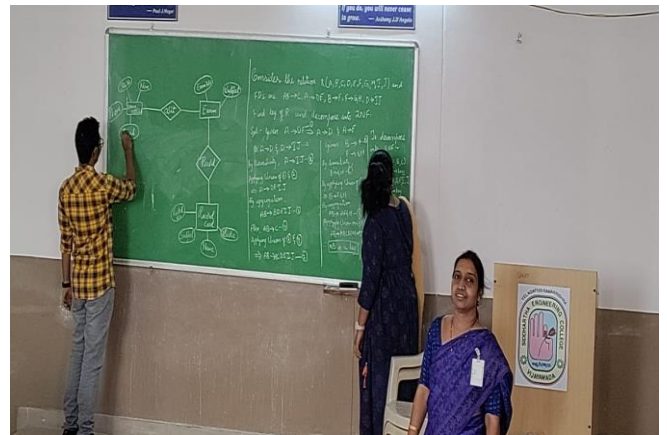
2	06	01	04	01	9.2	9.33	83.2
3	06	03	00	03	8.75	9.25	50
4	06	05	00	01	9.5	8.6	17
5	08	01	02	05	8.75	9.62	87.5
6	06	01	01	04	7	8	83.2
7	07	01	01	05	6.9	8.1	85.6
8	07	04	01	02	8	8.1	43.2
9	07	03	00	04	8.1	8.3	57.1
10	07	02	01	04	8.3	8.5	71.2

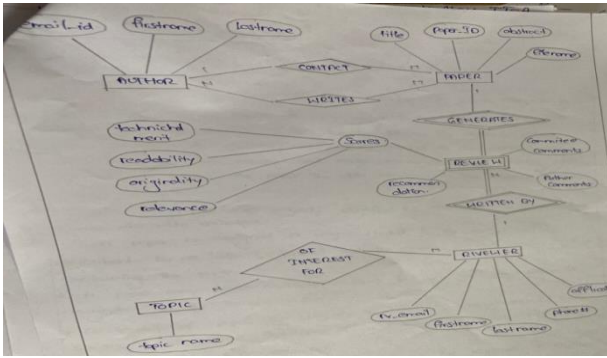
## Effectiveness of the Activity



■ GroupId	1	2	3	4	5	6	7	8	9	10
■ No of students involved in activity	6	6	6	6	8	6	7	7	7	7
■ Negative change	0	1	3	5	1	1	1	4	3	2
■ No change	2	4	0	0	2	1	1	1	0	1
■ Positive change	4	1	3	1	5	4	5	2	4	4
■ Group Impact(%)	100	83.2	50	17	87.5	83.2	85.6	43.2	57.1	71.2

### Supporting Evidences of the Activity :





Consider the relation REFRIG (Model #1, size, price, model, plant, volume) which is abbreviated as REFRIG (M, V, P, M, C) and the following set of functional dependencies:

$F = \{ M \rightarrow MP, \{M, V\} \rightarrow P, MP \rightarrow C \}$

Q) Evaluate each of the following as a candidate key for REFRIG, giving reasons why it can or cannot be a key:  $\{M\}$ ,  $\{M, V\}$ ,  $\{M, C\}$ .

D) Based on the above key determination, state whether the relation REFRIG is in 2NF and in BCNF, and provide proper reasons.

C) Consider the decomposition of REFRIG into  $D = \{R_1(M, V, P), R_2(M, P, C)\}$ . Is this decomposition lossless? Show why.

A)  $\{M\}$  is not a candidate key since it does not functionally determine the remaining

attributes P, M, P, and C, i.e., attributes V or P.  $\{M, V\}$  but M, P. By augmentation  $\{M, V\} \rightarrow MP$ . Since MP, C, by transitivity  $M \rightarrow MP, MP \rightarrow C$ . Given MC. By augmentation  $\{M, V\} \rightarrow C$ . Thus  $\{M, V\}$ ,  $\{M, P, C\}$  and  $\{M, V\}$  can be a candidate key.  $\{M, C\}$  is not in 2NF, a candidate key since it does not functionally determine attributes V or P.

Q)  $\{M\}$  is not in 2NF, due to the partial dependency  $\{M, V\} \rightarrow MP$  since  $\{M, V\}$  is not a super key. Therefore REFRIG is neither in 2NF nor in BCNF.

Alternatively - BCNF can be directly tested by verifying all of the given dependencies and finding out if the left hand side of each is a super key (or if the right hand side is a prime attribute).

