FINAL PROJECT BASIS DATA
Disusun untuk Memenuhi Tugas Mata Kuliah
Basis Data - B

Oleh :

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PROGRAM STUDI SARJANA STATISTIKA
JURUSAN STATISTIKA
FAKULTAS MATEMATIKA DAN ILMU PENGETAHUAN ALAM
UNIVERSITAS BRAWIJAYA
MALANG
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BAB I
TUJUAN

1.1 Tujuan

     a. Untuk mengetahui bentuk normalisasi tabel pada data.

     b. Untuk mengetahui langkah membuat database dan tabel pada MySQL.

     c. Untuk mengetahui relasi antar tabel.

     d. Untuk mengetahui langkah penggabungan 2 tabel dengan query join.

     e. Untuk mengetahui langkah dalam fungsi agregat dan klausa.

BAB II
HASIL & PEMBAHASAN

2.1 Data

Data yang digunakan adalah data "Pelatihan Karyawan" yang kami buat, sebagai berikut :

Employee ID	Employee Name	Department	Designation	Start Date Training	End Date Training	Days	Skill Code	Skills To Upgrade	Type	Location	Score	Grade	ID Trainer	Trainer Name
BAC12345	Raj Sharma	Administration	Admin Assist.	2019-05-01	2019-05-05	5	SKILL01	Call Management	Indoor	Room -3 Block A	8	SUCCESS	TRA12301	James Smith
BAC12353	Rajit	Administration	Admin Assist.	2019-05-01	2019-05-05	5	SKILL01				5	SUCCESS	TRA12301	
BAC12346	Ravi Gupta	Marketing	Telecaller	2019-05-02	2019-05-16	15	SKILL02	Customer Support	Indoor	Room-8 Block C	9	SUCCESS	TRA12302	Lucas
BAC12347	Ashi Pura	Marketing	Telecaller	2019-05-02	2019-05-16	15	SKILL02				4	FAILED	TRA12302	
BAC12350	Abhinandan	Marketing	Telecaller	2019-05-02	2019-05-16	15	SKILL02				2	FAILED	TRA12302	
BAC12354	Shiva	Marketing	Telecaller	2019-05-02	2019-05-16	15	SKILL02				4	FAILED	TRA12302	
BAC12348	Ankita	Sales	Team Leader	2019-05-03	2019-05-08	6	SKILL03	Team Spirit	Outdoor	BV Consultants ABC Bldg	5	SUCCESS	TRA12303	Eva
BAC12352	Krishna	Sales	Team Leader	2019-05-03	2019-05-08	6	SKILL03				6	SUCCESS	TRA12303	
BAC12355	Rajoo	Sales	Team Leader	2019-05-03	2019-05-08	6	SKILL03				7	SUCCESS	TRA12303	
BAC12349	Sujeet	Sales	Sales Rep	2019-05-05	2019-05-09	5	SKILL04	Sales Pitch	Outdoor	BV Consultants ABC Bldg	7	SUCCESS	TRA12304	Mike
BAC12351	Gurukrupa	Sales	Sales Rep	2019-05-05	2019-05-09	5	SKILL04				5	SUCCESS	TRA12304	

2.2 Hasil & Pembahasan

2.2.1 Normalisasi Tabel

Unnormalized

Tabel Unnormalized

Employee ID	Employee Name	Department	Designation	Start Date Trainin	End Date Training	Days	Skill Code	Skills To	Type	Location	Score	Grade	ID Trainer	Trainer Name
BAC12345	Raj Sharma	Administration	Admin Assist.	2019-05-01	2019-05-05	5	SKILL01	Call Management	Indoor	Room -3 Block A	8	SUCCESS	TRA12301	James Smith
BAC12353	Rajit	Administration	Admin Assist.	2019-05-01	2019-05-05	5	SKILL01				5	SUCCESS	TRA12301	
BAC12346	Ravi Gupta	Marketing	Telecaller	2019-05-02	2019-05-16	15	SKILL02	Customer Support	Indoor	Room-8 Block C	9	SUCCESS	TRA12302	Lucas
BAC12347	Ashi Pura	Marketing	Telecaller	2019-05-02	2019-05-16	15	SKILL02				4	FAILED	TRA12302	
BAC12350	Abhinandan	Marketing	Telecaller	2019-05-02	2019-05-16	15	SKILL02				2	FAILED	TRA12302	
BAC12354	Shiva	Marketing	Telecaller	2019-05-02	2019-05-16	15	SKILL02				4	FAILED	TRA12302	
BAC12348	Ankita	Sales	Team Leader	2019-05-03	2019-05-08	6	SKILL03	Team Spirit	Outdoor	BV Consultants ABC Bldg	5	SUCCESS	TRA12303	Eva
BAC12352	Krishna	Sales	Team Leader	2019-05-03	2019-05-08	6	SKILL03				6	SUCCESS	TRA12303	
BAC12355	Rajoo	Sales	Team Leader	2019-05-03	2019-05-08	6	SKILL03				7	SUCCESS	TRA12303	
BAC12349	Sujeet	Sales	Sales Rep	2019-05-05	2019-05-09	5	SKILL04	Sales Pitch	Outdoor	BV Consultants ABC Bldg	7	SUCCESS	TRA12304	Mike
BAC12351	Gurukrupa	Sales	Sales Rep	2019-05-05	2019-05-09	5	SKILL04				5	SUCCESS	TRA12304	

Normalisasi 1NF

Tabel Normalized 1NF

Employee ID	Employee Name	Department	Designation	Start Date Trainin	End Date Training	Days	Skill Code	Skills To	Type	Location	Score	Grade	ID Trainer	Trainer Name
BAC12345	Raj Sharma	Administration	Admin Assist.	2019-05-01	2019-05-05	5	SKILL01	Call Management	Indoor	Room -3 Block A	8	SUCCESS	TRA12301	James Smith
BAC12346	Ravi Gupta	Marketing	Telecaller	2019-05-02	2019-05-16	15	SKILL02	Customer Support	Indoor	Room-8 Block C	9	SUCCESS	TRA12302	Lucas
BAC12347	Ashi Pura	Marketing	Telecaller	2019-05-02	2019-05-16	15	SKILL02	Customer Support	Indoor	Room-8 Block C	4	FAILED	TRA12302	Lucas
BAC12348	Ankita	Sales	Team Leader	2019-05-03	2019-05-08	6	SKILL03	Team Spirit	Outdoor	BV Consultants ABC Bldg	5	SUCCESS	TRA12303	Eva
BAC12349	Sujeet	Sales	Sales Rep	2019-05-05	2019-05-09	5	SKILL04	Sales Pitch	Outdoor	BV Consultants ABC Bldg	7	SUCCESS	TRA12304	Mike
BAC12350	Abhinandan	Marketing	Telecaller	2019-05-02	2019-05-16	15	SKILL02	Customer Support	Indoor	Room-8 Block C	2	FAILED	TRA12302	Lucas
BAC12351	Gurukrupa	Sales	Sales Rep	2019-05-05	2019-05-09	5	SKILL04	Sales Pitch	Outdoor	BV Consultants ABC Bldg	5	SUCCESS	TRA12304	Mike
BAC12352	Krishna	Sales	Team Leader	2019-05-03	2019-05-08	6	SKILL03	Team Spirit	Outdoor	BV Consultants ABC Bldg	6	SUCCESS	TRA12303	Eva
BAC12353	Rajit	Administration	Admin Assist.	2019-05-01	2019-05-05	5	SKILL01	Call Management	Indoor	Room -3 Block A	5	SUCCESS	TRA12301	James Smith
BAC12354	Shiva	Marketing	Telecaller	2019-05-02	2019-05-16	15	SKILL02	Customer Support	Indoor	Room-8 Block C	4	FAILED	TRA12302	Lucas
BAC12355	Rajoo	Sales	Team Leader	2019-05-03	2019-05-08	6	SKILL03	Team Spirit	Outdoor	BV Consultants ABC Bldg	7	SUCCESS	TRA12303	Eva

Normalisasi 2NF

Tabel Peserta Training

Employee ID	Employee Name	Department	Designation
BAC12345	Raj Sharma	Administration	Admin Assist.
BAC12346	Ravi Gupta	Marketing	Telecaller
BAC12347	Ashi Pura	Marketing	Telecaller
BAC12348	Ankita	Sales	Team Leader
BAC12349	Sujeet	Sales	Sales Rep
BAC12350	Abhinandan	Marketing	Telecaller
BAC12351	Gurukrupa	Sales	Sales Rep
BAC12352	Krishna	Sales	Team Leader
BAC12353	Rajit	Administration	Admin Assist.
BAC12354	Shiva	Marketing	Telecaller
BAC12355	Rajoo	Sales	Team Leader

Tabel Trainer

ID Trainer	Trainer Name
TRA12301	James Smith
TRA12302	Lucas
TRA12303	Eva
TRA12304	Mike

Tabel Jadwal Training

Skill Code	Skills To Upgrade	Start Date Training	End Date Training	Days	Type	Location
SKILL01	Call Management	2019-05-01	2019-05-05	5	Indoor	Room -3 Block A
SKILL02	Customer Support	2019-05-02	2019-05-16	15	Indoor	Room-8 Block C
SKILL03	Team Spirit	2019-05-03	2019-05-08	6	Outdoor	BV Consultants ABC Bldg
SKILL04	Sales Pitch	2019-05-05	2019-05-09	5	Outdoor	BV Consultants ABC Bldg

Tabel Training

Employee ID	Skill Code	Skills To Upgrade	Score	Grade	ID Trainer
BAC12345	SKILL01	Call Management	8	SUCCESS	TRA12301
BAC12346	SKILL02	Customer Support	9	SUCCESS	TRA12302
BAC12347	SKILL02	Customer Support	4	FAILED	TRA12302
BAC12348	SKILL03	Team Spirit	5	SUCCESS	TRA12303
BAC12349	SKILL04	Sales Pitch	7	SUCCESS	TRA12304
BAC12350	SKILL02	Customer Support	2	FAILED	TRA12302
BAC12351	SKILL04	Sales Pitch	5	SUCCESS	TRA12304
BAC12352	SKILL03	Team Spirit	6	SUCCESS	TRA12303
BAC12353	SKILL01	Call Management	5	SUCCESS	TRA12301
BAC12354	SKILL02	Customer Support	4	FAILED	TRA12302
BAC12355	SKILL03	Team Spirit	7	SUCCESS	TRA12303

Tabel ini akan dinormalkan di Normalisasi 3NF

Normalisasi 3NF

Tabel Peserta Training

Employee ID	Employee Name	Department	Designation
BAC12345	Raj Sharma	Administration	Admin Assist.
BAC12346	Ravi Gupta	Marketing	Telecaller
BAC12347	Ashi Pura	Marketing	Telecaller
BAC12348	Ankita	Sales	Team Leader
BAC12349	Sujeet	Sales	Sales Rep
BAC12350	Abhinandan	Marketing	Telecaller
BAC12351	Gurukrupa	Sales	Sales Rep
BAC12352	Krishna	Sales	Team Leader
BAC12353	Rajit	Administration	Admin Assist.
BAC12354	Shiva	Marketing	Telecaller
BAC12355	Rajoo	Sales	Team Leader

Tabel Trainer

ID Trainer	Trainer Name
TRA12301	James Smith
TRA12302	Lucas
TRA12303	Eva
TRA12304	Mike

Tabel Jadwal Training

Skill Code	Skills To Upgrade	Start Date Training	End Date Training	Days	Type	Location
SKILL01	Call Management	2019-05-01	2019-05-05	5	Indoor	Room -3 Block A
SKILL02	Customer Support	2019-05-02	2019-05-16	15	Indoor	Room-8 Block C
SKILL03	Team Spirit	2019-05-03	2019-05-08	6	Outdoor	BV Consultants ABC Bldg
SKILL04	Sales Pitch	2019-05-05	2019-05-09	5	Outdoor	BV Consultants ABC Bldg

Tabel Skill Upgrade

Skills To Upgrade	Skill Code	ID Trainer
Call Management	SKILL01	TRA12301
Customer Support	SKILL02	TRA12302
Team Spirit	SKILL03	TRA12303
Sales Pitch	SKILL04	TRA12304

Tabel Grades

Skills To Upgrade	Employee ID	Score	Grade
Call Management	BAC12345	8	SUCCESS
Customer Support	BAC12346	9	SUCCESS
Customer Support	BAC12347	4	FAILED
Team Spirit	BAC12348	5	SUCCESS
Sales Pitch	BAC12349	7	SUCCESS
Customer Support	BAC12350	2	FAILED
Sales Pitch	BAC12351	5	SUCCESS
Team Spirit	BAC12352	6	SUCCESS
Call Management	BAC12353	5	SUCCESS
Customer Support	BAC12354	4	FAILED
Team Spirit	BAC12355	7	SUCCESS

Setelah Normalisasi 3NF didapat 5 tabel yang telah normal yaitu :

- Tabel Peserta Training
- Tabel Trainer
- Tabel Jadwal Training
- Tabel Skill Upgrade
- Tabel Grades

2.2.2 *Query MySQL*

No.	*Source Code*	Penjelasan
1.	```CREATE SCHEMA IF NOT EXISTS `Employee Training` ; USE `Employee Training` ;```	Membuat database Employee Training dan memanggil nya
2.	```CREATE TABLE IF NOT EXISTS `Employee Training`.`Tabel_Unormalized` (`employee_id` VARCHAR(20) NOT NULL, `employee_name` VARCHAR(45) NULL, `department` VARCHAR(45) NULL, `designation` VARCHAR(45) NULL, `start_date` DATE NULL, `end_date` DATE NULL, `days` INT UNSIGNED NULL, `skill_code` VARCHAR(20) NULL, `skill_upgrade` VARCHAR(45) NULL, `type` VARCHAR(45) NULL, `location` VARCHAR(45) NULL, `score` INT UNSIGNED NULL, `grade` VARCHAR(45) NULL, `trainer_id` VARCHAR(20) NULL, `trainer_name` VARCHAR(45) NULL, PRIMARY KEY (`employee_id`));```	Membuat tabel Unormalized dan memnentukan kolom dan tipe data nya serta menentukan primary key dari tabel
3.	```INSERT INTO `Employee Training`.`Tabel_Unormalized` VALUES ('BAC12345','Raj Sharma','Administration','Admin Assist.','2019-05-01','2019-05-05',5,'SKILL01','Call Management','Indoor','Room -3 Block A',8,'SUCCESS','TRA12301','James Smith'), ('BAC12353','Rajit','Administration','Admin Assist.','2019-05-01','2019-05-05',5,'SKILL01',NULL,NULL,NULL,5,'SUCCESS','TRA12301',NULL), ('BAC12346','Ravi Gupta','Marketing','Telecaller','2019-05-02','2019-05-```	Memasukkan values/record kedalam tabel Unormalized

```
16',15,'SKILL02','Customer
Support','Indoor','Room-8  Block
C',9,'SUCCESS','TRA12302','Luca
s '),
    ('BAC12347','Ashi
Pura','Marketing','Telecaller',
'2019-05-02','2019-05-
16',15,'SKILL02',NULL,NULL,NULL
,4,'FAILED','TRA12302',NULL),

('BAC12350','Abhinandan','Marke
ting','Telecaller','2019-05-
02','2019-05-
16',15,'SKILL02',NULL,NULL,NULL
,2,'FAILED','TRA12302',NULL),

('BAC12354','Shiva','Marketing'
,'Telecaller','2019-05-
02','2019-05-
16',15,'SKILL02',NULL,NULL,NULL
,4,'FAILED','TRA12302',NULL),

('BAC12348','Ankita','Sales','T
eam  Leader','2019-05-03','2019-
05-08',6,'SKILL03','Team
Spirit','Outdoor','BV
Consultants              ABC
Bldg',5,'SUCCESS','TRA12303','E
va '),

('BAC12352','Krishna','Sales','
Team Leader','2019-05-03','2019-
05-
08',6,'SKILL03',NULL,NULL,NULL,
6,'SUCCESS','TRA12303',NULL),

('BAC12355','Rajoo','Sales','Te
am   Leader','2019-05-03','2019-
05-
08',6,'SKILL03',NULL,NULL,NULL,
7,'SUCCESS','TRA12303',NULL),

('BAC12349','Sujeet','Sales','S
ales Rep','2019-05-05','2019-05-
09',5,'SKILL04','Sales
Pitch','Outdoor','BV Consultants
ABC
Bldg',7,'SUCCESS','TRA12304','M
ike'),
```

	('BAC12351','Gurukrupa','Sales','Sales Rep','2019-05-05','2019-05-09',5,'SKILL04',NULL,NULL,NULL,5,'SUCCESS','TRA12304',NULL); SELECT*FROM `Employee Training`.`Tabel_Unormalized`; SELECT*FROM Tabel_Unormalized ORDER BY skill_code ASC;	

4.	CREATE TABLE IF NOT EXISTS `Employee Training`.`Tabel_Normalized` (
	  `employee_id` VARCHAR(20) NOT NULL,
	  `employee_name` VARCHAR(45) NOT NULL,
	  `department` VARCHAR(45) NOT NULL,
	  `designation` VARCHAR(45) NOT NULL,
	  `start_date` DATE NOT NULL,
	  `end_date` DATE NOT NULL,
	  `days` INT UNSIGNED NOT NULL,
	  `skill_code` VARCHAR(20) NOT NULL,
	  `skill_upgrade` VARCHAR(45) NOT NULL,
	  `type` VARCHAR(45) NOT NULL,
	  `location` VARCHAR(45) NOT NULL,
	  `score` INT UNSIGNED NOT NULL,
	  `grade` VARCHAR(45) NOT NULL,
	  `trainer_id` VARCHAR(20) NOT NULL,
	  `trainer_name` VARCHAR(45) NOT NULL,
	  PRIMARY KEY (`employee_id`));
		Membuat tabel Normalized dan memnentukan kolom dan tipe data nya serta menentukan primary key dari tabel

5.	INSERT INTO `Employee Training`.`Tabel_Normalized` VALUES
	    ('BAC12345','Raj Sharma','Administration','Admin Assist.','2019-05-01','2019-05-05',5,'SKILL01','Call Management','Indoor','Room -3 Block A',8,'SUCCESS','TRA12301','James Smith'),
	    ('BAC12346','Ravi Gupta','Marketing','Telecaller'
		Memasukkan value/record kedalam tabel Normalized

```
,'2019-05-02','2019-05-
16',15,'SKILL02','Customer
Support','Indoor','Room-8  Block
C',9,'SUCCESS','TRA12302','Luca
s '),
    ('BAC12347','Ashi
Pura','Marketing','Telecaller',
'2019-05-02','2019-05-
16',15,'SKILL02','Customer
Support','Indoor','Room-8  Block
C',4,'FAILED','TRA12302','Lucas
'),

('BAC12348','Ankita','Sales','T
eam  Leader','2019-05-03','2019-
05-08',6,'SKILL03','Team
Spirit','Outdoor','BV
Consultants            ABC
Bldg',5,'SUCCESS','TRA12303','E
va '),

('BAC12349','Sujeet','Sales','S
ales Rep','2019-05-05','2019-05-
09',5,'SKILL04','Sales
Pitch','Outdoor','BV Consultants
ABC
Bldg',7,'SUCCESS','TRA12304','M
ike'),

('BAC12350','Abhinandan','Marke
ting','Telecaller','2019-05-
02','2019-05-
16',15,'SKILL02','Customer
Support','Indoor','Room-8  Block
C',2,'FAILED','TRA12302','Lucas
'),

('BAC12351','Gurukrupa','Sales'
,'Sales Rep','2019-05-05','2019-
05-09',5,'SKILL04','Sales
Pitch','Outdoor','BV Consultants
ABC
Bldg',5,'SUCCESS','TRA12304','M
ike'),

('BAC12352','Krishna','Sales','
Team Leader','2019-05-03','2019-
05-08',6,'SKILL03','Team
Spirit','Outdoor','BV
Consultants            ABC
```

	Bldg',6,'SUCCESS','TRA12303','E va '), ('BAC12353','Rajit','Administra tion','Admin Assist.','2019-05-01','2019-05-05',5,'SKILL01','Call Management','Indoor','Room -3 Block A',5,'SUCCESS','TRA12301','Jame s Smith'), ('BAC12354','Shiva','Marketing' ,'Telecaller','2019-05-02','2019-05-16',15,'SKILL02','Customer Support','Indoor','Room-8 Block C',4,'FAILED','TRA12302','Lucas '), ('BAC12355','Rajoo','Sales','Te am Leader','2019-05-03','2019-05-08',6,'SKILL03','Team Spirit','Outdoor','BV Consultants ABC Bldg',7,'SUCCESS','TRA12303','E va '); SELECT*FROM `Employee Training`.`Tabel_Normalized`;	

6.	CREATE TABLE IF NOT EXISTS `Employee Training`.`Tabel_Peserta_Traini ng` (
	  `employee_id` VARCHAR(20) NOT NULL,
	  `employee_name` VARCHAR(45) NOT NULL,
	  `department` VARCHAR(45) NOT NULL,
	  `designation` VARCHAR(45) NOT NULL,
	  PRIMARY KEY (`employee_id`));
		Membuat tabel Tabel_Peserta_Training dan memnentukan kolom dan tipe data nya serta menentukan primary key dari tabel

7.	INSERT INTO `Employee Training`.`Tabel_Peserta_Traini ng` VALUES
	    ('BAC12345','Raj Sharma','Administration','Admin Assist.'),
	    ('BAC12346','Ravi Gupta','Marketing','Telecaller'
		Memasukkan value/record kedalam tabel Tabel_Peserta_Training

	),
	    ('BAC12347','Ashi Pura','Marketing','Telecaller'),
	
	    ('BAC12348','Ankita','Sales','Team Leader'),
	
	    ('BAC12349','Sujeet','Sales','Sales Rep'),
	
	    ('BAC12350','Abhinandan','Marketing','Telecaller'),
	
	    ('BAC12351','Gurukrupa','Sales','Sales Rep'),
	
	    ('BAC12352','Krishna','Sales','Team Leader'),
	
	    ('BAC12353','Rajit','Administration','Admin Assist.'),
	
	    ('BAC12354','Shiva','Marketing','Telecaller'),
	
	    ('BAC12355','Rajoo','Sales','Team Leader');
	SELECT*FROM `Employee Training`.`Tabel_Peserta_Training`;	

8.	CREATE TABLE IF NOT EXISTS `Employee Training`.`Tabel_Trainer` (
	  `trainer_id` VARCHAR(20) NOT NULL,
	  `trainer_name` VARCHAR(45) NOT NULL,
	  PRIMARY KEY (`trainer_id`));
		Membuat tabel Tabel_Trainer dan memnnentukan kolom dan tipe data nya serta menentukan primary key dari tabel

9.	INSERT INTO `Employee Training`.`Tabel_Trainer` VALUES
	    ('TRA12301','James Smith'),
	    ('TRA12302','Lucas'),
	    ('TRA12303','Eva'),
	    ('TRA12304','Mike');
	SELECT*FROM `Employee Training`.`Tabel_Trainer`;
		Memasukkan value/record kedalam tabel Tabel_Trainer

10.	CREATE TABLE IF NOT EXISTS `Employee Training`.`Tabel_Skill_Upgrade`	Membuat tabel Tabel_Skill Upgrade dan memnnentukan kolom dan tipe data nya serta menentukan primary key dari tabel

| | ```
(
  `skill_upgrade`   VARCHAR(45)
NOT NULL,
  `skill_code` VARCHAR(20)  NOT
NULL,
  `trainer_id` VARCHAR(20)  NOT
NULL,
  PRIMARY KEY (`skill_upgrade`),
  INDEX          `trainer_id_idx`
(`trainer_id` ASC) VISIBLE,
  CONSTRAINT `trainer_id`
    FOREIGN KEY (`trainer_id`)
    REFERENCES          `Employee
Training`.`Tabel_Trainer`
(`trainer_id`)
    ON DELETE NO ACTION
    ON UPDATE NO ACTION);
``` | |
| 11. | ```
INSERT          INTO    `Employee
Training`.`Tabel_Skill_Upgrade`
VALUES
    ('Call
Management','SKILL01','TRA12301
'),
    ('Customer
Support','SKILL02','TRA12302'),
    ('Team
Spirit','SKILL03','TRA12303'),
    ('Sales
Pitch','SKILL04','TRA12304');
SELECT*FROM          `Employee
Training`.`Tabel_Skill_Upgrade`
;
``` | Memasukkan value/record kedalam tabel Tabel_Skill_Upgrade |
| 12. | ```
CREATE   TABLE   IF   NOT   EXISTS
`Employee
Training`.`Tabel_Grades` (
  `skill_upgrade`   VARCHAR(45)
NOT NULL,
  `employee_id` VARCHAR(20)  NOT
NULL,
  `score` INT UNSIGNED NOT NULL,
  `grade` VARCHAR(45) NOT NULL,
  PRIMARY                   KEY
(`employee_id`,`skill_upgrade`)
,
  INDEX          `employee_id_idx`
(`employee_id` ASC) VISIBLE,
  CONSTRAINT `employee_id`
    FOREIGN KEY (`employee_id`)
    REFERENCES          `Employee
Training`.`Tabel_Peserta_Traini
``` | Membuat tabel Tabel_Grades dan memnentukan kolom dan tipe data nya serta menentukan primary key dari tabel |

	ng` (`employee_id`)
	    ON DELETE NO ACTION
	    ON UPDATE NO ACTION);	

13.	INSERT INTO `Employee Training`.`Tabel_Grades` VALUES
	    ('Call Management','BAC12345',8,'SUCCESS'),
	    ('Customer Support','BAC12346',9,'SUCCESS'),
	    ('Customer Support','BAC12347',4,'FAILED'),
	    ('Team Spirit','BAC12348',5,'SUCCESS'),
	    ('Sales Pitch','BAC12349',7,'SUCCESS'),
	    ('Customer Support','BAC12350',2,'FAILED'),
	    ('Sales Pitch','BAC12351',5,'SUCCESS'),
	    ('Team Spirit','BAC12352',6,'SUCCESS'),
	    ('Call Management','BAC12353',5,'SUCCESS'),
	    ('Customer Support','BAC12354',4,'FAILED'),
	    ('Team Spirit','BAC12355',7,'SUCCESS');
	SELECT*FROM `Employee Training`.`Tabel_Grades`;
		Memasukkan value/record kedalam Tabel_Grades

14.	CREATE TABLE IF NOT EXISTS `Employee Training`.`Tabel_Jadwal_Training` (
	  `skill_code` VARCHAR(20) NOT NULL,
	  `skill_upgrade` VARCHAR(45) NOT NULL,
	  `start_date` DATE NOT NULL,
	  `end_date` DATE NOT NULL,
	  `days` INT UNSIGNED NOT NULL,
		Membuat tabel Tabel_Jadwal_Training dan memnentukan kolom dan tipe data nya serta menentukan primary key dari tabel

	`type` VARCHAR(45) NOT NULL,
	  `location` VARCHAR(45) NOT NULL,
	  PRIMARY KEY (`skill_code`),
	  INDEX `skill_upgrade_idx` (`skill_upgrade` ASC) VISIBLE,
	  UNIQUE INDEX `skill_upgrade_UNIQUE` (`skill_upgrade` ASC) VISIBLE,
	  FOREIGN KEY (`skill_upgrade`)
	  REFERENCES `Employee Training`.`Tabel_Skill_Upgrade` (`skill_upgrade`)
	  ON DELETE NO ACTION
	  ON UPDATE NO ACTION);	

15.	INSERT INTO `Employee Training`.`Tabel_Jadwal_Training` VALUES
	  ('SKILL01','Call Management','2019-05-01','2019-05-05',5,'Indoor','Room -3 Block A'),
	  ('SKILL02','Customer Support','2019-05-02','2019-05-16',15,'Indoor','Room-8 Block C'),
	  ('SKILL03','Team Spirit','2019-05-03','2019-05-08',6,'Outdoor','BV Consultants ABC Bldg'),
	  ('SKILL04','Sales Pitch','2019-05-05','2019-05-09',5,'Outdoor','BV Consultants ABC Bldg');
	SELECT*FROM `Employee Training`.`Tabel_Jadwal_Training`;
		Memasukkan value/record kedalam tabel Tabel_Jadwal_Training

2.2.3 Relasi Tabel

Berikut adalah field dalam Tabel_Unormalized dan Tabel_Normalized :

Berikut adalah relasi dari tabel yang telah dinormalisasikan :

2.2.4 Join Tabel

a. Inner Join

```sql
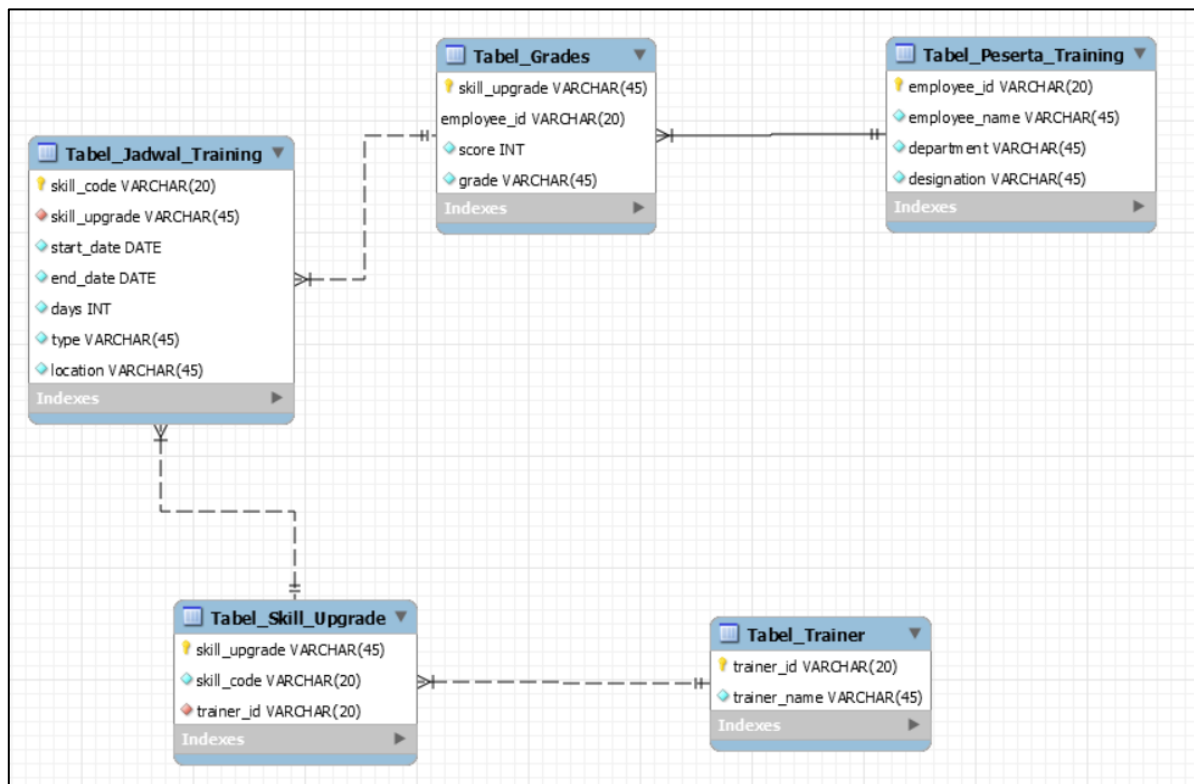SELECT `Tabel_Skill_Upgrade`.`skill_upgrade`, `Tabel_Skill_Upgrade`.`skill_code`,
`Tabel_Skill_Upgrade`.`trainer_id`, `Tabel_Trainer`.`trainer_name`
FROM `Tabel_Skill_Upgrade`
INNER JOIN `Tabel_Trainer` ON `Tabel_Skill_Upgrade`.`trainer_id` =
`Tabel_Trainer`.`trainer_id`;
```

skill_upgrade	skill_code	trainer_id	trainer_name
Call Management	SKILL01	TRA12301	James Smith
Customer Support	SKILL02	TRA12302	Lucas
Sales Pitch	SKILL04	TRA12304	Mike
Team Spirit	SKILL03	TRA12303	Eva

b. Left Join

```sql
SELECT*FROM `Tabel_Grades` LEFT JOIN `Tabel_Skill_Upgrade`
ON `Tabel_Grades`.`skill_upgrade` = `Tabel_Skill_Upgrade`.`skill_upgrade`;
```

skill_upgrade	employee_id	score	grade	skill_upgrade	skill_code	trainer_id
Call Management	BAC12345	8	SUCCESS	Call Management	SKILL01	TRA12301
Customer Support	BAC12346	9	SUCCESS	Customer Support	SKILL02	TRA12302
Customer Support	BAC12347	4	FAILED	Customer Support	SKILL02	TRA12302
Team Spirit	BAC12348	5	SUCCESS	Team Spirit	SKILL03	TRA12303
Sales Pitch	BAC12349	7	SUCCESS	Sales Pitch	SKILL04	TRA12304
Customer Support	BAC12350	2	FAILED	Customer Support	SKILL02	TRA12302
Sales Pitch	BAC12351	5	SUCCESS	Sales Pitch	SKILL04	TRA12304
Team Spirit	BAC12352	6	SUCCESS	Team Spirit	SKILL03	TRA12303
Call Management	BAC12353	5	SUCCESS	Call Management	SKILL01	TRA12301
Customer Support	BAC12354	4	FAILED	Customer Support	SKILL02	TRA12302
Team Spirit	BAC12355	7	SUCCESS	Team Spirit	SKILL03	TRA12303

c. Right Join

```sql
SELECT*FROM `Tabel_Skill_Upgrade` RIGHT JOIN `Tabel_Trainer`
ON `Tabel_Skill_Upgrade`.`trainer_id` = `Tabel_Trainer`.`trainer_id`;
```

skill_upgrade	skill_code	trainer_id	trainer_id	trainer_name
Call Management	SKILL01	TRA12301	TRA12301	James Smith
Customer Support	SKILL02	TRA12302	TRA12302	Lucas
Team Spirit	SKILL03	TRA12303	TRA12303	Eva
Sales Pitch	SKILL04	TRA12304	TRA12304	Mike

2.2.5 Fungsi Agregat

a. Max & Min

```
SELECT MAX(`score`)
FROM `Tabel_Grades`;
```

```
SELECT MIN(`score`)
FROM `Tabel_Grades`;
```

MAX(`score`)
▶ 9

MIN(`score`)
▶ 2

```
SELECT*FROM Tabel_Grades WHERE score=(SELECT MAX(score) FROM Tabel_Grades);
```

	skill_upgrade	employee_id	score	grade
▶	Customer Support	BAC12346	9	SUCCESS
*	NULL	NULL	NULL	NULL

```
SELECT*FROM Tabel_Grades WHERE score=(SELECT MIN(score) FROM Tabel_Grades);
```

	skill_upgrade	employee_id	score	grade
▶	Customer Support	BAC12350	2	FAILED
*	NULL	NULL	NULL	NULL

b. Count & Average

```
SELECT `grade`, COUNT(`score`)
FROM `Tabel_Grades`
GROUP BY `grade`;
```

```
SELECT `grade`, AVG(`score`)
FROM `Tabel_Grades`
GROUP BY `grade`;
```

	grade	COUNT(`score`)
▶	SUCCESS	8
	FAILED	3

	grade	AVG(`score`)
▶	SUCCESS	6.5000
	FAILED	3.3333

c. Group Concat

```
SELECT skill_upgrade, score,
GROUP_CONCAT(DISTINCT employee_id SEPARATOR '; ') AS "Employee ID Training"
FROM Tabel_Grades GROUP BY skill_upgrade;
#Kurang maksimal digunakan karena tidak dapat dapat mencangkup semua record pada
Tabel_Grades
```

	skill_upgrade	score	Employee ID Training
▶	Call Management	8	BAC12345; BAC12353
	Customer Support	9	BAC12346; BAC12347; BAC12350; BAC12354
	Sales Pitch	7	BAC12349; BAC12351
	Team Spirit	5	BAC12348; BAC12352; BAC12355

2.2.6 Fungsi Klausa

a. Select

```
SELECT  `employee_id`,`employee_name`,`department` FROM `Tabel_Peserta_Training`;
```

employee_id	employee_name	department
BAC12345	Raj Sharma	Administration
BAC12346	Ravi Gupta	Marketing
BAC12347	Ashi Pura	Marketing
BAC12348	Ankita	Sales
BAC12349	Sujeet	Sales
BAC12350	Abhinandan	Marketing
BAC12351	Gurukrupa	Sales
BAC12352	Krishna	Sales
BAC12353	Rajit	Administration
BAC12354	Shiva	Marketing
BAC12355	Rajoo	Sales
NULL	NULL	NULL

```
SELECT  `employee_id`,`score`,`grade` FROM `Tabel_Grades` WHERE `score` > 5;
```

employee_id	score	grade
BAC12345	8	SUCCESS
BAC12346	9	SUCCESS
BAC12349	7	SUCCESS
BAC12352	6	SUCCESS
BAC12355	7	SUCCESS

b. Order By

```
SELECT*FROM `Tabel_Grades`
ORDER BY `score` ASC;
```

employee_id	employee_name	department	designation
BAC12349	Sujeet	Sales	Sales Rep
BAC12354	Shiva	Marketing	Telecaller
BAC12346	Ravi Gupta	Marketing	Telecaller
BAC12355	Rajoo	Sales	Team Leader
BAC12353	Rajit	Administration	Admin Assist.
BAC12345	Raj Sharma	Administration	Admin Assist.
BAC12352	Krishna	Sales	Team Leader
BAC12351	Gurukrupa	Sales	Sales Rep
BAC12347	Ashi Pura	Marketing	Telecaller
BAC12348	Ankita	Sales	Team Leader
BAC12350	Abhinandan	Marketing	Telecaller
NULL	NULL	NULL	NULL

```
SELECT*FROM `Tabel_Peserta_Training`
ORDER BY `employee_name` DESC;
```

skill_upgrade	employee_id	score	grade
Customer Support	BAC12350	2	FAILED
Customer Support	BAC12347	4	FAILED
Customer Support	BAC12354	4	FAILED
Team Spirit	BAC12348	5	SUCCESS
Sales Pitch	BAC12351	5	SUCCESS
Call Management	BAC12353	5	SUCCESS
Team Spirit	BAC12352	6	SUCCESS
Sales Pitch	BAC12349	7	SUCCESS
Team Spirit	BAC12355	7	SUCCESS
Call Management	BAC12345	8	SUCCESS
Customer Support	BAC12346	9	SUCCESS
NULL	NULL	NULL	NULL

c. Like

```
SELECT*FROM `Tabel_Trainer` WHERE `trainer_name` LIKE 'Lucas';
```

trainer_id	trainer_name
TRA12302	Lucas
NULL	NULL

d. And / Or

```
SELECT*FROM `Tabel_Jadwal_Training` WHERE `skill_upgrade` LIKE '%t' OR `location` LIKE
'R%';
```

skill_code	skill_upgrade	start_date	end_date	days	type	location
SKILL01	Call Management	2019-05-01	2019-05-05	5	Indoor	Room -3 Block A
SKILL02	Customer Support	2019-05-02	2019-05-16	15	Indoor	Room-8 Block C
SKILL03	Team Spirit	2019-05-03	2019-05-08	6	Outdoor	BV Consultants ABC Bldg
NULL	NULL	NULL	NULL	NULL	NULL	NULL

```
SELECT*FROM `Tabel_Jadwal_Training` WHERE `skill_upgrade` LIKE '%t' AND `location`
LIKE 'R%';
```

skill_code	skill_upgrade	start_date	end_date	days	type	location
SKILL01	Call Management	2019-05-01	2019-05-05	5	Indoor	Room -3 Block A
SKILL02	Customer Support	2019-05-02	2019-05-16	15	Indoor	Room-8 Block C
NULL	NULL	NULL	NULL	NULL	NULL	NULL

BAB III
PENUTUP

3.1 Kesimpulan

Basis data atau juga disebut database artinya berbasiskan pada data, tetapi secara konseptual, database diartikan sebuah koleksi atau kumpulan datadata yang saling berhubungan (relation), disusun menurut aturan tertentu secara logis, sehingga menghasilkan informasi. Untuk mengelola dan memanggil query basis data agar dapat disajikan dalam berbagai bentuk yang diinginkan dibutuhkan perangkat lunak yang disebut Sistem Manajemen Basis Data atau juga disebut Database Management System (DBMS). Penggabungan Database Management System (DBMS) dengan Basis Data akan membentuk satu kesatuan yang disebut Sistem Basis Data.

Berdasarkan tugas normalisasi diatas, dapat disimpulkan bahwa tujuan dilakukannya normalisasi adalah untuk menghasilkan struktur tabel yang normal atau optimal sehingga dapat meminimalisir redudansi data dan mencegah anomali. Normalisasi dilakukan dari tahap bentuk yang tidak normal (unnormalized), bentuk normal pertama (1 NF), bentuk normal kedua (2 NF), dan seterusnya sampai didapatkan struktur tabel yang optimal.

Join merupakan salah satu konstruksi dasar dari SQL dan basis data. Join dapat didefinisikan sebagai kombinasi record dari dua atau lebih tabel di dalam basis data relasional dan menghasilkan sebuah tabel (temporary) baru yang disebut sebagai joined table. Ada macam-macam join yaitu inner join,outer join, right outer join, full outer join, dll yang memiliki fungsi tersendiri. Untuk penelitian kali ini kami menggunakan inner join, right join dan left join.

Operasi tabel pada SQL diantaranya adalah agregat dan klausa dimana fungsi agregat (*aggregate*) adalah fungsi yang menerima koleksi nilai dan mengembalikan nilai tunggal sebagai hasilnya. Standar ISO mendefinisikan lima jenis fungsi agregat yaitu *Count, Sum, Avg, Min, Max, dan Group Concat*. Sedangkan *clause* diantaranya adalah *Group By, Where, Order By.*

3.2 Saran

Dalam melakukan normalisasi, pembuatan dan penggabungan tabel, sebaiknya harus paham terlebih dahulu langkah-langkah untuk melakukan normalisasi serta *syntax* yang digunakan. Pemahaman yang matang mengenai beberapa istilah seperti *primary key, foreign key, join tabel,* operasi tabel, dan sebagainya juga penting. Agar kita dapat dengan mudah melakukan pengolahan data, sebaiknya kita memperbanyak pemahaman dan pelatihan MySQL. Kemajuan komputer di masa mendatang diharapkan dapat membantu semua jenis pekerjaan manusia sehingga lebih efektif dan efesien karena dimasa depan teknologi akan semakin canggih dan semua pekerjaan akan dilakukan dengan system komputerisasi.