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PROJECT PHASE 3

SECD2523 - DATABASE

SEMESTER I - SESSION 2023/2024

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SECTION : 06

GROUP NAME : NPC

< SUSTAINCONNECT.JOHORDB >

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1.0 Introduction

In response to the pressing global challenges posed by climate change and environmental degradation, numerous nations across the world have increased their efforts towards sustainable development. Malaysia has actively engaged in a few sustainable initiatives which helps Malaysian cities implement strategies for low-carbon development.

The Johor government has also formulated its plan to foster low-carbon societies through a series of strategic initiatives and comprehensive plans. These frameworks act as a set of guidelines that communities, educational institutions, and local government bodies can use to coordinate their efforts in the direction of lowering carbon intensity and advancing sustainable practices.

MBIP, the key stakeholder in Iskandar Puteri Low Carbon (IPRK), seeks to collect energy-saving data within different communities, such as residential areas, factories, and more. The Iskandar Puteri Low Carbon Calendar Competition is one of the initiatives established to reduce electricity and energy consumption within the Iskandar Puteri region. A new data collection and platform is proposed to map the carbon footprint within the MBIP region, calculating carbon reductions and identifying communities with high CO₂ emissions.

“SUSTAINCONNECT.JOHORDB” is a proposed database that is used to store related information from the data collection platform. This database is able to store user-related personal information like gender, full name, address and the data they input, such as electricity consumption, water consumption, and waste consumption. This proposed database is able to sort and organize related information based on the user ID, IC number, address, and their corresponding consumption. This ensures that MBIP is able to examine the consumption data of certain users based on their personal information, such as their ID or IC number.

Furthermore, centralizing information enables data integrity, reducing redundancy and inconsistencies that ensure the data stored is accurate for MBIP to make an informed decision. Accurate carbon footprint mapping helps MBIP identify the emission level of each region in Iskandar Puteri, and this carbon footprint mapping will be associated with calculated carbon footprints to ensure the mapping is reliable. MBIP is able to view the emission level of an area based on the mapping ID or location name and identify communities with high CO₂ emissions.

2.0 Overview Of Project

This phase 3 document is a database logical design that proposes a detailed plan for the implementation of the database system by showing ERD, EERD, logical ERD, normalization, and hence the SQL statements (both DDL and DML).

Updated business rules are shown in this document, which outlines specific regulations, constraints, or guidelines for the database system. In addition, the conceptual ERD in the phase 2 document is converted into a logical ERD, which offers a more detailed depiction of the database, including primary keys, foreign keys, and cardinalities, translating the conceptual model into a more refined structure. An updated data dictionary is shown to describe each data element, entity, attribute, and their relationships, providing a comprehensive glossary for the database schema. Moreover, a normalization process is applied to the database schema to minimize redundancy and dependency issues and ensure data integrity.

Lastly, the database schema is illustrated in the form of tables, which show how entities, attributes, and relationships are translated into a relational database format post-normalization. A database system will then be created by using SQL statements.

3.0 Database Conceptual Design

3.1 Updated Business Rule

1. Each participant can fill in many electric data, while each electric data is filled in by one participant.
2. Each participant can fill in many water data, while each water data is filled in by one participant.
3. Each participant can fill in many waste data, while each waste data is filled in by one participant.
4. Each MBIP can view many carbon footprint mapping, while each carbon footprint mapping can be viewed by many MBIP.
5. Each calculated carbon footprint is associated with many electric data, while each electric data has one calculated carbon footprint.
6. Each calculated carbon footprint is associated with many water data, while each water data has one calculated carbon footprint.
7. Each calculated carbon footprint is associated with many waste data, while each waste data has one calculated carbon footprint.
8. Each carbon footprint mapping is associated with one calculated carbon footprint, while each calculated footprint belongs to one carbon footprint mapping.

3.2 Conceptual ERD

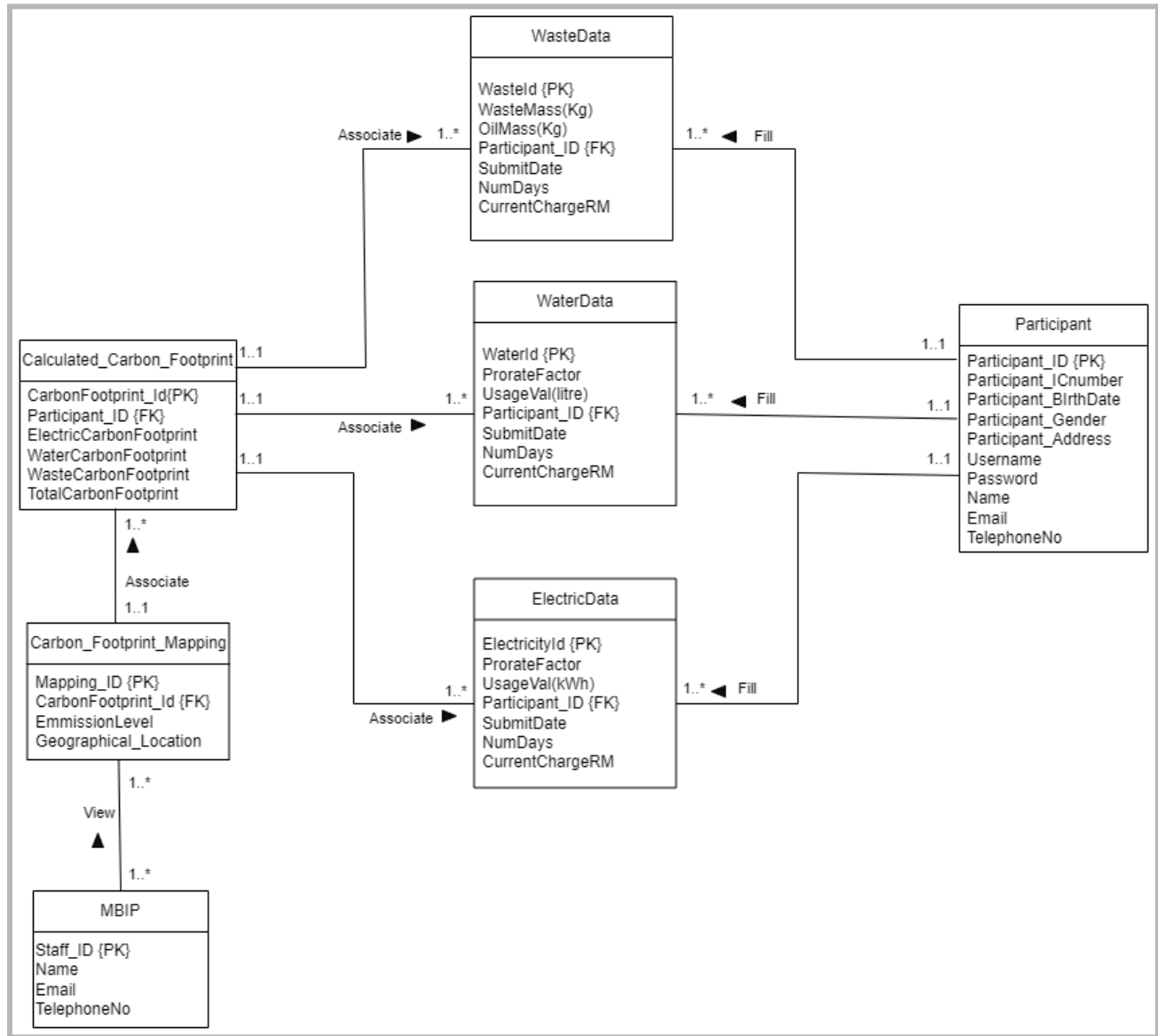


Figure 3.2 Conceptual ERD of SUSTAINCONNECT.JOHORDB

3.3 Enhanced ERD

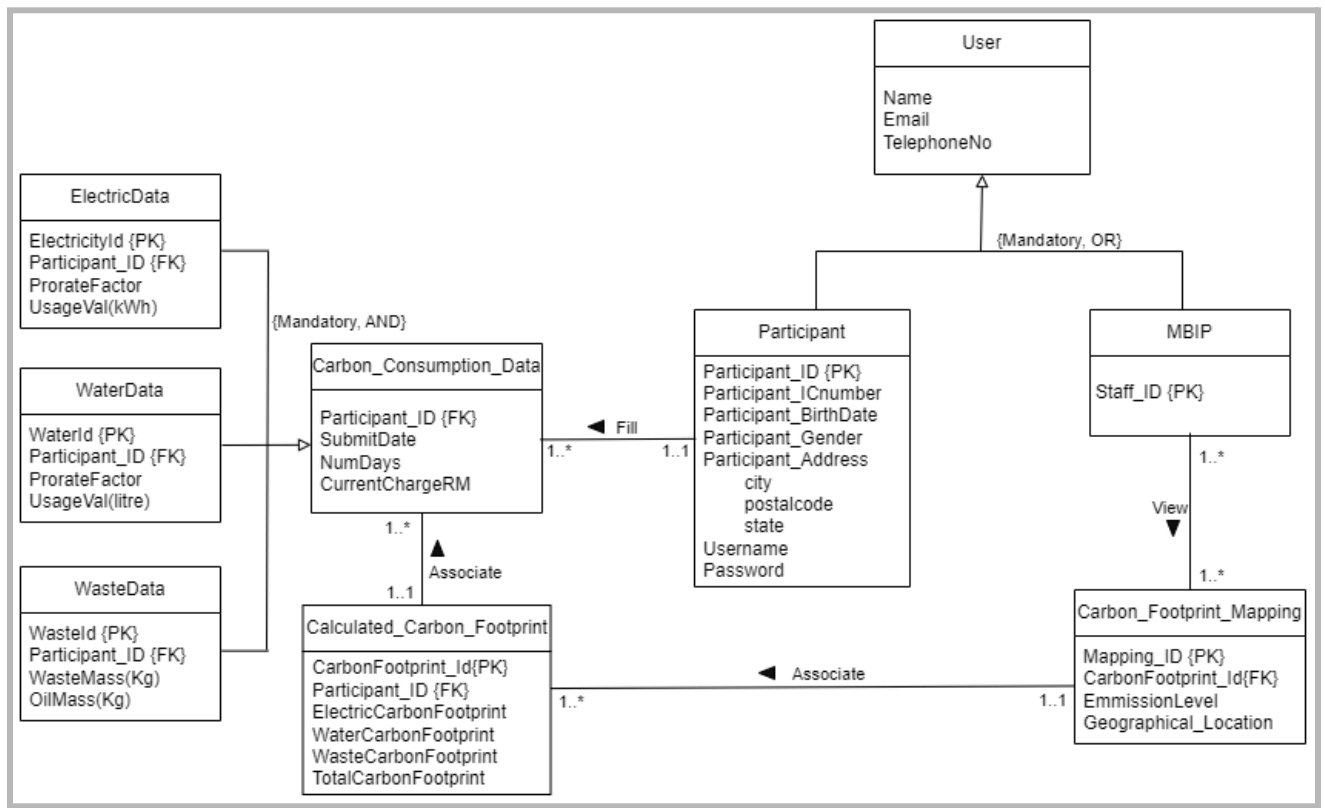


Figure 3.3 Enhanced ERD of SUSTAINCONNECT.JOHORDB

4.2 Updated Data Dictionary

4.2.1 Description of Entities

Entity	Description	Occurrence
Participant	Hold the personal informations of participant	Register as participant and fill in relevant personal informations
MBIP	Hold personal information of MBIP staff	MBIP staffs are given staff ID
WaterData	Hold data of water consumption	Participants enter water consumption data into SUSTAINCONNECT.JOHORDB system for carbon footprint calculation
ElectricData	Hold data of electric consumption	Participants enter electric consumption data into SUSTAINCONNECT.JOHORDB system for carbon footprint calculation
WasteData	Hold data of waste consumption	Participants enter the waste collection data into SUSTAINCONNECT.JOHORDB system for carbon footprint calculation
Carbon_Footprint _Mapping	Hold data of carbon footprint mapping	Carbon footprint data entered by participants are analyzed and the area is determined for carbon footprint mapping.
Calculated_Carbon _Footprint	Hold data of carbon footprint	Three consumption data entered by participant are calculated

4.2.2 Description of Relationship

Entity	Multiplicity	Relationship	Multiplicity	Entity
Participant	1..1	Fill	1..*	WaterData
	1..1	Fill	1..*	ElectricData
	1..1	Fill	1..*	WasteData
MBIP	1..*	View	1..*	Carbon_Footprint _Mapping
Carbon_Footprint _Mapping	1..1	Associate	1..*	Calculated_Carbon _Footprint
Calculated_Carbon _Footprint	1..1	Associate	1..*	WaterData
	1..1	Associate	1..*	ElectricData
	1..1	Associate	1..*	WasteData

4.2.3 Description of Attributes

Entity	Attribute	Description	Data Type	Constraint
Participant	Participant_Id	Registered Participant ID	VARCHAR2(15)	PRIMARY KEY
	Participant_ICnumber	Participant's IC Number	NUMBER(15)	NOT NULL
	Participant_BirthDate	Participant's Date of Birth	DATE	NOT NULL
	Participant_Gender	Participant's Gender	VARCHAR2(10)	NOT NULL
	Participant_Address	Participant's Address	VARCHAR2(30)	NOT NULL
	Name	User's Full Name	VARCHAR2(30)	NOT NULL
	Username	User's ID	VARCHAR2(30)	UNIQUE
	Password	User's Account Password	VARCHAR2(20)	NOT NULL
	Email	User's Personal Email	VARCHAR2(25)	UNIQUE
	TelephoneNo	User's Telephone Number	NUMBER(12)	UNIQUE
MBIP	Staff_Id	Staff's ID	VARCHAR2(15)	PRIMARY KEY
	Name	Staff's Name	VARCHAR2(30)	NOT NULL
	Email	Staff's Email	VARCHAR2(25)	UNIQUE
	TelephoneNo	Staff's Phone Number	NUMBER(12)	UNIQUE
WaterData	WaterId	Water Consumption Data ID	VARCHAR2(15)	PRIMARY KEY

	Participant_Id	Registered Participant Id	VARCHAR2(15)	FOREIGN KEY REFERENCE PARTICIPANT
	SubmitDate	Submission Date	DATE	NOT NULL
	NumDays	Number of Days	NUMBER(3)	NOT NULL
	ProrateFactor	Prorate Factor	NUMBER(4,3)	NOT NULL
	UsageVal	Usage Value	NUMBER(15)	NOT NULL
	CurrentChargeRM	Current Charge	NUMBER(6,2)	NOT NULL
ElectricData	ElectricityId	Electric Consumption Data Id	VARCHAR2(15)	PRIMARY KEY
	Participant_Id	Registered Participant Id	VARCHAR2(15)	FOREIGN KEY REFERENCE PARTICIPANT
	SubmitDate	Submission Date	DATE	NOT NULL
	NumDays	Number of Days	NUMBER(3)	NOT NULL
	ProrateFactor	Prorate Factor	NUMBER(4,3)	NOT NULL
	UsageVal	Usage Value	NUMBER(15)	NOT NULL
	CurrentChargeRM	Current Charge (RM)	NUMBER(6,2)	NOT NULL
WasteData	WasteId	Waste Consumption Data Id	VARCHAR2(15)	PRIMARY KEY
	Participant_Id	Registered participant Id	VARCHAR2(15)	FOREIGN KEY REFERENCE PARTICIPANT

	WasteMass	Mass of Waste Collected	NUMBER(6,2)	NOT NULL
	OilMass	Mass of Oil Collected	NUMBER(6,2)	NOT NULL
	NumDays	Number of Days	NUMBER(3)	NOT NULL
	SubmitDate	Submission Date	DATE	NOT NULL
	CurrentChargeRM	Current Charge (RM)	NUMBER(6,2)	NOT NULL
Carbon _Footprint _Mapping	Mapping_Id	Carbon Mapping Id	VARCHAR2(15)	PRIMARY KEY
	CarbonFootprint_Id	Calculated Carbon Footprint Id	VARCHAR2(15)	FOREIGN KEY REFERENCE CALCULATED CARBON FOOTPRINT
	EmissionLevel	Carbon Emission Level	VARCHAR2(10)	NOT NULL
	Geographical_Location	Geographical Location of Carbon Location	VARCHAR2(30)	NOT NULL
Calculated _Carbon _Footprint	CarbonFootprint_Id	Calculated Carbon Footprint Id	VARCHAR2(15)	PRIMARY KEY
	Participant_Id	Registered participant Id	VARCHAR2(15)	FOREIGN KEY REFERENCE PARTICIPANT
	ElectricCarbonFootprint	Calculated Electric Carbon Footprint	NUMBER(6,2)	NOT NULL
	WaterCarbonFootprint	Calculated Water Carbon Footprint	NUMBER(6,2)	NOT NULL

	WasteCarbonFootprint	Calculated Waste Carbon Footprint	NUMBER(6,2)	NOT NULL
	TotalCarbonFootprint	Calculated Total Carbon Footprint	DECIMAL(6,2)	NOT NULL

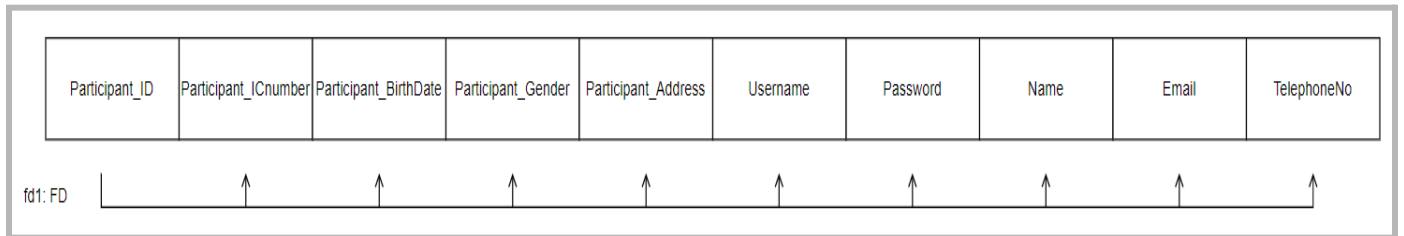
4.3 Normalization

1. Participant (Participant_Id, Participant_ICnumber, Participant_BirthDate, Participant_Gender, Participant_Address, Username, Password, Name, Email, TelephoneNo)

fd1: Participant_Id → Participant_ICnumber, Participant_BirthDate, Participant_Gender, Participant_Address, Username, Password, Name, Email, TelephoneNo (Primary Key))

1NF & 2NF & 3NF & BCNF:

Participant (Participant_Id, Participant_ICnumber, Participant_BirthDate, Participant_Gender, Participant_Address, Username, Password, Name, Email, TelephoneNo)

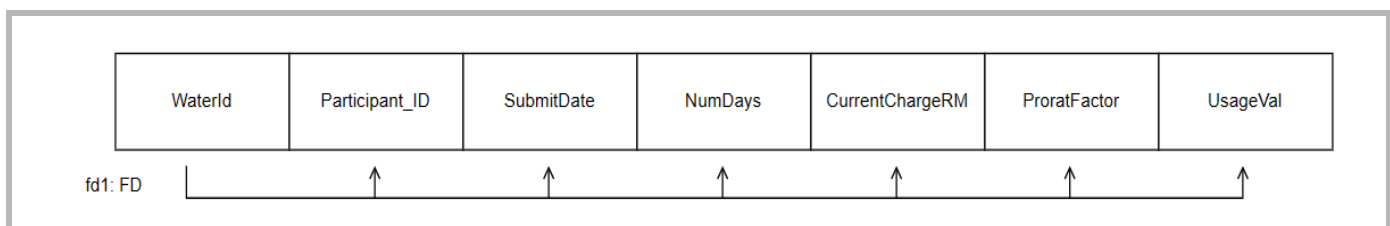


2. WaterData (WaterId, Participant_Id, SubmitDate, NumDays, CurrentChargeRM, ProrateFactor, UsageVal)

fd1: WaterId → Participant_Id, SubmitDate, NumDays, CurrentChargeRM, ProrateFactor, UsageVal (Primary Key)

1NF & 2NF & 3NF & BCNF:

WaterData (WaterId, Participant_Id, SubmitDate, NumDays, CurrentChargeRM, ProrateFactor, UsageVal)

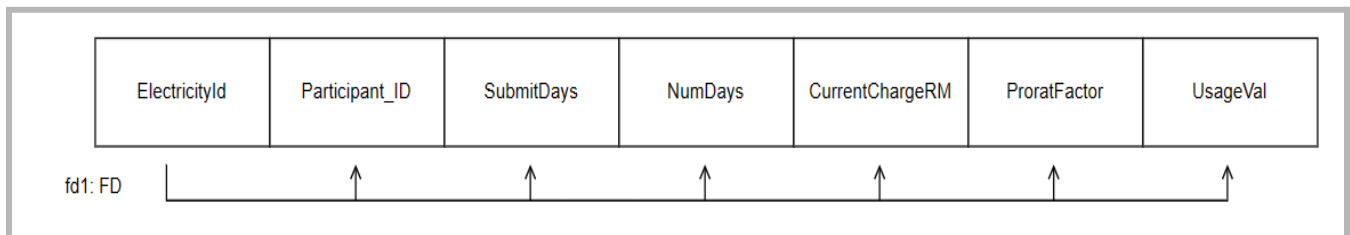


- ElectricData (ElectricityId, Participant_Id, SubmitDate, NumDays, CurrentChargeRM, ProrateFactor, UsageVal)

fd1: ElectricityId → Participant_Id, SubmitDate, NumDays, CurrentChargeRM, ProrateFactor, UsageVal (Primary Key)

1NF & 2NF & 3NF & BCNF:

ElectricData (ElectricityId, Participant_ID, SubmitDate, NumDays, CurrentChargeRM, ProrateFactor, UsageVal)

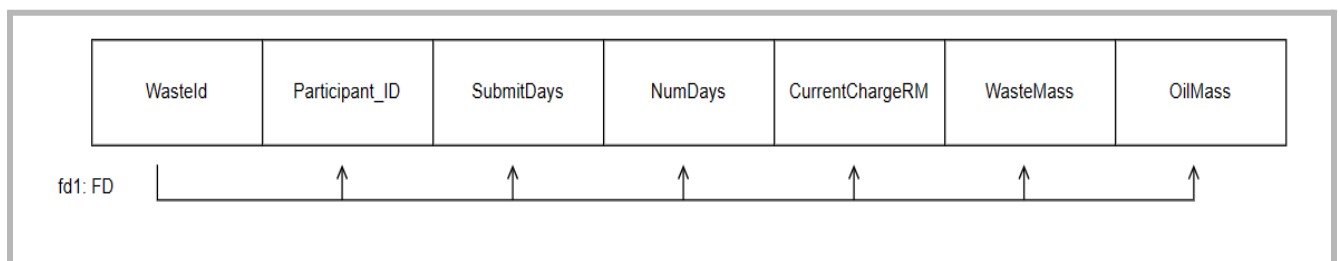


- WasteData (WasteId, Participant_Id, SubmitDate, NumDays, CurrentChargeRM, WasteMass, OilMass)

fd1: WasteId → Participant_Id, SubmitDate, NumDays, CurrentChargeRM, WasteMass, OilMass (Primary Key)

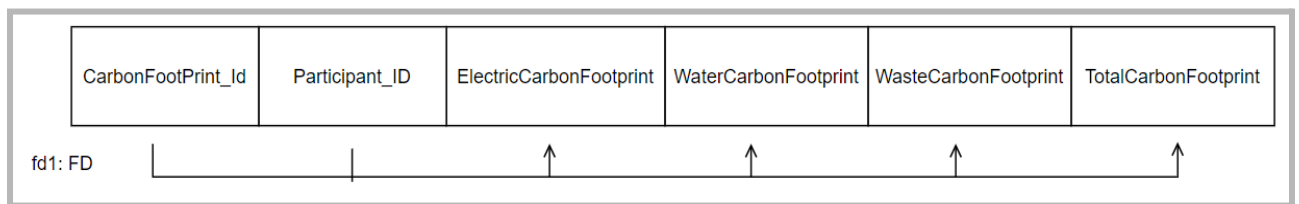
1NF & 2NF & 3NF & BCNF:

WasteData (WasteId, Participant_Id, SubmitDate, NumDays, CurrentChargeRM, WasteMass, OilMass)



5. Calculated_Carbon_Footprint (CarbonFootprint_Id, Participant_Id, ElectricCarbonFootprint, WaterCarbonFootprint, WasteCarbonFootprint, TotalCarbonFootprint)

1NF & 2NF & 3NF & BCNF:



- fd1:** Mapping_ID → CarbonFootprint_Id, EmissionLevel, Geographical_Location
(Primary Key)

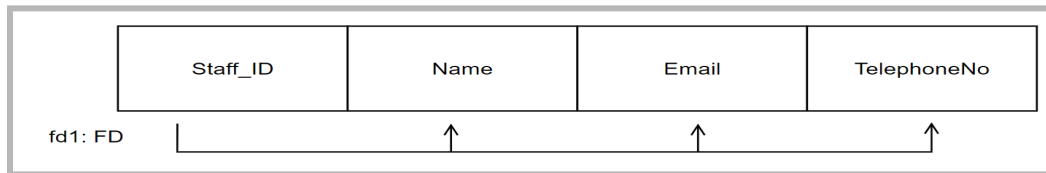
Carbon_Footprint_Mapping (Mapping_ID, CarbonFootprint_Id, EmissionLevel, Geographical Location)

7. MBIP (Staff_Id, Name, Email, TelephoneNo)

fd1: Staff_Id → Name, Email, TelephoneNo (Primary Key)

1NF & 2NF & 3NF & BCNF:

MBIP (Staff_Id, Name, Email, TelephoneNo)



****Remark : Underline phrase is Primary Key ****

5.0 Relational DB Schemas (After Normalization)

1. Participant (Participant_Id, Participant_ICnumber, Participant_BirthDate, Participant_Gender, Participant_Address, Username, Password, Name, Email, TelephoneNo)

Participant_Id	Participant_ICnumber	Participant_BirthDate	Participant_Gender	Participant_Address	Username	Password	Name	Email	TelephoneNo
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2. WaterData (WaterId, Participant_Id, SubmitDate, NumDays, CurrentChargeRM, ProrateFactor, UsageVal)

WaterId	Participant_Id	SubmitDate	NumDays	CurrentChargeRM	ProrateFactor	UsageVal
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3. ElectricData (ElectricityId, Participant_Id, SubmitDate, NumDays, CurrentChargeRM, ProrateFactor, UsageVal)

ElectricityId	Participant_Id	SubmitDate	NumDays	CurrentChargeRM	ProrateFactor	UsageVal
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4. WasteData (WasteId, Participant_Id, SubmitDate, NumDays, CurrentChargeRM, WasteMass, OilMass)

WasteId	Participant_Id	SubmitDate	NumDays	CurrentChargeRM	WasteMass	OilMass
---------	----------------	------------	---------	-----------------	-----------	---------

5. Calculated_Carbon_Footprint (CarbonFootprint_Id, Participant_Id, ElectricCarbonFootprint, WaterCarbonFootprint, WasteCarbonFootprint, TotalCarbonFootprint)

CarbonFootprint_Id	Participant_Id	ElectricCarbonFootprint	WaterCarbonFootprint	WasteCarbonFootprint	TotalCarbonFootprint
--------------------	----------------	-------------------------	----------------------	----------------------	----------------------

6. Carbon_Footprint_Mapping (Mapping_Id, CarbonFootprint_Id, EmissionLevel, Geographical_Location)

Mapping_Id	CarbonFootprint_Id	EmissionLevel	Geographical_Location
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7. MBIP (Staff_Id, Name, Email, TelephoneNo)

Staff_Id	Name	Email	TelephoneNo
----------	------	-------	-------------

**** Remark : Underline phrase is Primary Key ****

6.0 SQL Statements (DDL & DML)

-----Table List-----

-----Participant-----

```
CREATE TABLE Participant (  
    Participant_Id VARCHAR2(15),  
    Participant_ICnumber NUMBER(15) NOT NULL,  
    Participant_BirthDate DATE NOT NULL,  
    Participant_Gendar VARCHAR2(10) NOT NULL,  
    Participant_Address VARCHAR2(30) NOT NULL,  
    Name VARCHAR2(30) NOT NULL,  
    Username VARCHAR2(30) CONSTRAINT Part_Username_Uk UNIQUE,  
    Password VARCHAR2(20) NOT NULL,  
    Email VARCHAR2(25) CONSTRAINT Part_Email_Uk UNIQUE,  
    TelephoneNo NUMBER(12) CONSTRAINT Part_TeleNo_Uk UNIQUE,  
    CONSTRAINT Participant_Id_PK PRIMARY KEY (Participant_Id)  
);
```

-----ElectricData-----

```
CREATE TABLE ElectricData(  
    ElectricityId VARCHAR2(15),  
    Participant_Id VARCHAR2(15),  
    SubmitDate DATE NOT NULL,  
    NumDays NUMBER(3) NOT NULL,  
    CurrentChargeRM NUMBER(6,2) NOT NULL,  
    ProrateFactor NUMBER(4,3) NOT NULL,  
    UsageVal NUMBER(15) NOT NULL,  
    CONSTRAINT ElectricityId_PK PRIMARY KEY (ElectricityId),  
    CONSTRAINT ETParticipant_Id_fk FOREIGN KEY (Participant_Id)  
        REFERENCES Participant(Participant_Id)  
);
```

WaterData

```
CREATE TABLE WaterData(  
  WaterId VARCHAR2(15),  
  Participant_Id VARCHAR2(15),  
  SubmitDate DATE NOT NULL,  
  NumDays NUMBER(3) NOT NULL,  
  CurrentChargeRM NUMBER(6,2) NOT NULL,  
  ProrateFactor NUMBER(4,3) NOT NULL,  
  UsageVal NUMBER(15) NOT NULL,  
  CONSTRAINT WaterId_PK PRIMARY KEY (WaterId),  
  CONSTRAINT WTParticipant_Id_fk FOREIGN KEY (Participant_Id)  
    REFERENCES Participant(Participant_Id)  
);
```

WasteData

```
CREATE TABLE WasteData(  
  WasteId VARCHAR2(15),  
  Participant_Id VARCHAR2(15),  
  SubmitDate DATE NOT NULL,  
  NumDays NUMBER(3) NOT NULL,  
  CurrentChargeRM NUMBER(6,2) NOT NULL,  
  WasteMass NUMBER(6,2) NOT NULL,  
  OilMass NUMBER(6,2) NOT NULL,  
  CONSTRAINT WasteId_PK PRIMARY KEY (WasteId),  
  CONSTRAINT WSParticipant_Id_fk FOREIGN KEY (Participant_Id)  
    REFERENCES Participant(Participant_Id)  
);
```

-----Calculated_Carbon_Footprint-----

```
CREATE TABLE Calculated_Carbon_Footprint(  
  CarbonFootprint_Id VARCHAR2(15),  
  Participant_Id VARCHAR2(15),  
  ElectricCarbonFootprint NUMBER(6,2) NOT NULL,  
  WaterCarbonFootprint NUMBER(6,2) NOT NULL,  
  WasteCarbonFootprint NUMBER(6,2) NOT NULL,  
  TotalCarbonFootprint NUMBER(6,2) NOT NULL,  
  CONSTRAINT CarbonFootprint_Id_PK PRIMARY KEY (CarbonFootprint_Id),  
  CONSTRAINT CFPparticipant_Id_fk FOREIGN KEY (Participant_Id)  
    REFERENCES Participant(Participant_Id)  
);
```

-----Carbon_Footprint_Mapping-----

```
CREATE TABLE Carbon_Footprint_Mapping(  
  Mapping_Id VARCHAR2(15),  
  CarbonFootprint_Id VARCHAR2(15),  
  EmissionLevel VARCHAR2(10) NOT NULL,  
  Geographical_Location VARCHAR2(30) NOT NULL,  
  CONSTRAINT Mapping_Id_PK PRIMARY KEY (Mapping_Id),  
  CONSTRAINT CMCarbonFootprint_Id_fk FOREIGN KEY (CarbonFootprint_Id)  
    REFERENCES Calculated_Carbon_Footprint(CarbonFootprint_Id)  
);
```

-----MBIP-----

```
CREATE TABLE MBIP(  
  Staff_Id VARCHAR2(15),  
  Name VARCHAR2(30) NOT NULL,  
  Email VARCHAR2(25) NOT NULL,  
  TelephoneNo NUMBER(12) CONSTRAINT MBIP_TeleNo_Uk UNIQUE,  
  CONSTRAINT StaffId_PK PRIMARY KEY (Staff_Id)  
);
```

Data List

Participant

```
INSERT INTO Participant (Participant_Id, Participant_ICnumber, Participant_BirthDate,
Participant_Gendar, Participant_Address, Name, Username, Password, Email, TelephoneNo)
VALUES ('AAA0001', 970120011113, TO_DATE('200197', 'DDMMYY'), 'Male', 'Jalan
Pahlawan 2', 'Ahmad Aiman', 'Aiman113', 'Ahmad9701', 'Aiman113@gmail.com', 0102437890);
```

```
INSERT INTO Participant (Participant_Id, Participant_ICnumber, Participant_BirthDate,
Participant_Gendar, Participant_Address, Name, Username, Password, Email, TelephoneNo)
VALUES ('AAB0002', 980121011112, TO_DATE('210198', 'DDMMYY'), 'Female', 'Jalan
Perwira 1', 'Veena Kaur', 'Veena112', 'Kaur9801', 'Veena112@gmail.com', 0102345609);
```

```
INSERT INTO Participant (Participant_Id, Participant_ICnumber, Participant_BirthDate,
Participant_Gendar, Participant_Address, Name, Username, Password, Email, TelephoneNo)
VALUES ('ACE0003', 980117011018, TO_DATE('170198', 'DDMMYY'), 'Female', 'Jalan
Perwira 17', 'Wong Shi Qi', 'ShiQi117', 'Wong9801', 'ShiQi117@gmail.com', 0115679645);
```

```
INSERT INTO Participant (Participant_Id, Participant_ICnumber, Participant_BirthDate,
Participant_Gendar, Participant_Address, Name, Username, Password, Email, TelephoneNo)
VALUES ('AAD0004', 970218014323, TO_DATE('180297', 'DDMMYY'), 'Male', 'Jalan Layang
16', 'Koh Kai Zuan', 'KaiZuan218', 'Koh9702', 'KaiZuan@gmail.com', 0178994620);
```

```
INSERT INTO Participant (Participant_Id, Participant_ICnumber, Participant_BirthDate,
Participant_Gendar, Participant_Address, Name, Username, Password, Email, TelephoneNo)
VALUES ('ABA0005', 880317012325, TO_DATE('170388', 'DDMMYY'), 'Male', 'Jalan Naknob
12', 'Sharvin Kumar', 'Sharvin317', 'Kumar8803', 'Sharvin@gmail.com', 0193212320);
```

```
INSERT INTO Participant (Participant_Id, Participant_ICnumber, Participant_BirthDate,
Participant_Gendar, Participant_Address, Name, Username, Password, Email, TelephoneNo)
VALUES ('BAB0006', 870316013456, TO_DATE('160387', 'DDMMYY'), 'Female', 'Jalan
Bentara 20', 'Siti Amzah', 'Siti316', 'Amzah8703', 'Siti316@gmail.com', 0106543480);
```

```
INSERT INTO Participant (Participant_Id, Participant_ICnumber, Participant_BirthDate,
Participant_Gendar, Participant_Address, Name, Username, Password, Email, TelephoneNo)
VALUES ('BBA0007', 850214019403, TO_DATE('140285', 'DDMMYY'), 'Male', 'Jalan Perwira
18', 'Kuan Tong Ji', 'KuanJi214', 'Tong8502', 'KuanJi214@gmail.com', 0119873434);
```



```
INSERT INTO Participant (Participant_Id, Participant_ICnumber, Participant_BirthDate,
Participant_Gendar, Participant_Address, Name, Username, Password, Email, TelephoneNo)
VALUES ('BBC0008', 960221013403, TO_DATE('210296', 'DDMMYY'), 'Female', 'Jalan
Ronggeng 12', 'Lee Hui Wen', 'HuiWen221', 'Lee9602', 'HuiWen221@gmail.com', 0111475555);
```

```
INSERT INTO Participant (Participant_Id, Participant_ICnumber, Participant_BirthDate,
Participant_Gendar, Participant_Address, Name, Username, Password, Email, TelephoneNo)
VALUES ('BAA0009', 990420013453, TO_DATE('200499', 'DDMMYY'), 'Male', 'Jalan Uda
15', 'Tan Jian Heng', 'TanHeng420', 'Jian9904', 'TanHeng@gmail.com', 0197416784);
```

```
INSERT INTO Participant (Participant_Id, Participant_ICnumber, Participant_BirthDate,
Participant_Gendar, Participant_Address, Name, Username, Password, Email, TelephoneNo)
VALUES ('BAC0010', 990703012935, TO_DATE('030799', 'DDMMYY'), 'Male', 'Jalan Impian
5/2', 'Al Safa', 'Safa703', 'Al9907', 'Safa703@gmail.com', 0172587457);
```

```
INSERT INTO Participant (Participant_Id, Participant_ICnumber, Participant_BirthDate,
Participant_Gendar, Participant_Address, Name, Username, Password, Email, TelephoneNo)
VALUES ('CDB0011', 900803014323, TO_DATE('030890', 'DDMMYY'), 'Female', 'Jalan
Sutera 8/4', 'Mullai Kordy', 'Mullai803', 'Kordy9008', 'Mullai@gmail.com', 0178522345);
```

```
INSERT INTO Participant (Participant_Id, Participant_ICnumber, Participant_BirthDate,
Participant_Gendar, Participant_Address, Name, Username, Password, Email, TelephoneNo)
VALUES ('CCA0012', 921004015646, TO_DATE('041092', 'DDMMYY'), 'Female', 'Jalan
Persiaran 2', 'Lim Zi Qin', 'ZiQin004', 'Lim9210', 'ZiQin004@gmail.com', 0103694534);
```

```
INSERT INTO Participant (Participant_Id, Participant_ICnumber, Participant_BirthDate,
Participant_Gendar, Participant_Address, Name, Username, Password, Email, TelephoneNo)
VALUES ('CBA0013', 861030013422, TO_DATE('301086', 'DDMMYY'), 'Female', 'Jalan
Budaya 1', 'Shila Haliza', 'Shila030', 'Haliza8610', 'Shila030@gmail.com', 0106390875);
```

```
INSERT INTO Participant (Participant_Id, Participant_ICnumber, Participant_BirthDate,
Participant_Gendar, Participant_Address, Name, Username, Password, Email, TelephoneNo)
VALUES ('CDB0014', 881126016575, TO_DATE('261188', 'DDMMYY'), 'Male', 'Jalan Muri
1/9', 'Ven Suci', 'Ven126', 'Suci8811', 'Ven1@gmail.com', 0192550453);
```

```
INSERT INTO Participant (Participant_Id, Participant_ICnumber, Participant_BirthDate,
Participant_Gendar, Participant_Address, Name, Username, Password, Email, TelephoneNo)
VALUES ('CCD0015', 940312015465, TO_DATE('120394', 'DDMMYY'), 'Male', 'Jalan Medani
8', 'Kew Ding Shan', 'DingShan312', 'Kew9403', 'DingShan@gmail.com', 0173433246);
```

```
INSERT INTO Participant (Participant_Id, Participant_ICnumber, Participant_BirthDate,
Participant_Gendar, Participant_Address, Name, Username, Password, Email, TelephoneNo)
VALUES ('DED0016', 000812014645, TO_DATE('120800', 'DDMMYY'), 'Male', 'Jalan Indah
16/8', 'Alif Aiman', 'Alif812', 'Aiman0008', 'Alif@gmail.com', 0118992342);
```

```
INSERT INTO Participant (Participant_Id, Participant_ICnumber, Participant_BirthDate,
Participant_Gendar, Participant_Address, Name, Username, Password, Email, TelephoneNo)
VALUES ('DAD0017', 010714018687, TO_DATE('140701', 'DDMMYY'), 'Male', 'Jalan
NusaJaya 1/1 ', 'Ryan Singh', 'Ryan714', 'SIngh0107', 'Ryan@gmail.com', 0109877859);
```

```
INSERT INTO Participant (Participant_Id, Participant_ICnumber, Participant_BirthDate,
Participant_Gendar, Participant_Address, Name, Username, Password, Email, TelephoneNo)
VALUES ('DAC0018', 990617012432, TO_DATE('170699', 'DDMMYY'), 'Female', 'Jalan
Indah 28/1', 'Nik Zulaikha', 'Zul617', 'Nik9906', 'Zul@gmail.com', 0116543454);
```

```
INSERT INTO Participant (Participant_Id, Participant_ICnumber, Participant_BirthDate,
Participant_Gendar, Participant_Address, Name, Username, Password, Email, TelephoneNo)
VALUES ('DBA0019', 000519015337, TO_DATE('190500', 'DDMMYY'), 'Male', 'Jalan Bestari
5/5', 'Mou Tak Ding', 'TakDing519', 'Mou0005', 'TakDing@gmail.com', 0113210753);
```

```
INSERT INTO Participant (Participant_Id, Participant_ICnumber, Participant_BirthDate,
Participant_Gendar, Participant_Address, Name, Username, Password, Email, TelephoneNo)
VALUES ('DCE0020', 940509013454, TO_DATE('090594', 'DDMMYY'), 'Female', 'Jalan Nusia
11/7', 'Nur Haslina', 'Haslina509', 'Nur9405', 'Haslina@gmail.com', 0171193455);
```

-----ElectricData-----

```
INSERT INTO ElectricData (ElectricityId, Participant_Id, SubmitDate, NumDays,
CurrentChargeRM, ProrateFactor, UsageVal)
VALUES ('EE0002', 'AAB0002', TO_DATE('011123', 'DDMMYY'), 30, 155.43, 0.584, 452);
```

```
INSERT INTO ElectricData (ElectricityId, Participant_Id, SubmitDate, NumDays,
CurrentChargeRM, ProrateFactor, UsageVal)
VALUES ('EE0003', 'ACE0003', TO_DATE('111123', 'DDMMYY'), 30, 94.54, 0.584, 334);
```

```
INSERT INTO ElectricData (ElectricityId, Participant_Id, SubmitDate, NumDays,
CurrentChargeRM, ProrateFactor, UsageVal)
VALUES ('EE0004', 'AAD0004', TO_DATE('101123', 'DDMMYY'), 30, 133.24, 0.584, 409);
```

```

INSERT INTO ElectricData (ElectricityId, Participant_Id, SubmitDate, NumDays,
CurrentChargeRM, ProrateFactor, UsageVal)
VALUES ('EE0005', 'ABA0005', TO_DATE('211123', 'DDMMYY'), 30, 61.27, 0.584, 269);

INSERT INTO ElectricData (ElectricityId, Participant_Id, SubmitDate, NumDays,
CurrentChargeRM, ProrateFactor, UsageVal)
VALUES ('EE0006', 'BAB0006', TO_DATE('021123', 'DDMMYY'), 30, 136.34, 0.584, 415);

INSERT INTO ElectricData (ElectricityId, Participant_Id, SubmitDate, NumDays,
CurrentChargeRM, ProrateFactor, UsageVal)
VALUES ('EE0007', 'BBA0007', TO_DATE('041123', 'DDMMYY'), 30, 67.59, 0.584, 289);

INSERT INTO ElectricData (ElectricityId, Participant_Id, SubmitDate, NumDays,
CurrentChargeRM, ProrateFactor, UsageVal)
VALUES ('EE0008', 'BBC0008', TO_DATE('301123', 'DDMMYY'), 30, 80.61, 0.584, 307);

INSERT INTO ElectricData (ElectricityId, Participant_Id, SubmitDate, NumDays,
CurrentChargeRM, ProrateFactor, UsageVal)
VALUES ('EE0009', 'BAA0009', TO_DATE('131123', 'DDMMYY'), 30, 38.81, 0.584, 296);

INSERT INTO ElectricData (ElectricityId, Participant_Id, SubmitDate, NumDays,
CurrentChargeRM, ProrateFactor, UsageVal)
VALUES ('EE0010', 'BAC0010', TO_DATE('071123', 'DDMMYY'), 30, 37.31, 0.584, 288);

INSERT INTO ElectricData (ElectricityId, Participant_Id, SubmitDate, NumDays,
CurrentChargeRM, ProrateFactor, UsageVal)
VALUES ('EE0011', 'CDB0011', TO_DATE('111223', 'DDMMYY'), 30, 58.63,0.584, 245);

INSERT INTO ElectricData (ElectricityId, Participant_Id, SubmitDate, NumDays,
CurrentChargeRM, ProrateFactor, UsageVal)
VALUES ('EE0012', 'CCA0012', TO_DATE('171223', 'DDMMYY'), 30, 87.32,0.584, 320);

INSERT INTO ElectricData (ElectricityId, Participant_Id, SubmitDate, NumDays,
CurrentChargeRM, ProrateFactor, UsageVal)
VALUES ('EE0013', 'CBA0013', TO_DATE('211123', 'DDMMYY'), 30, 51.28,0.584, 223);

INSERT INTO ElectricData (ElectricityId, Participant_Id, SubmitDate, NumDays,
CurrentChargeRM, ProrateFactor, UsageVal)
VALUES ('EE0014', 'CDB0014', TO_DATE('241123', 'DDMMYY'), 30, 73.66,0.584, 290);

```

```
INSERT INTO ElectricData (ElectricityId, Participant_Id, SubmitDate, NumDays,  
CurrentChargeRM, ProrateFactor, UsageVal)  
VALUES ('EE0015', 'CCD0015', TO_DATE('231123', 'DDMMYY'), 30, 86.29,0.584, 318);
```

```
INSERT INTO ElectricData (ElectricityId, Participant_Id, SubmitDate, NumDays,  
CurrentChargeRM, ProrateFactor, UsageVal)  
VALUES ('EE0016', 'DED0016', TO_DATE('251223', 'DDMMYY'), 30, 53.62,0.584, 230);
```

```
INSERT INTO ElectricData (ElectricityId, Participant_Id, SubmitDate, NumDays,  
CurrentChargeRM, ProrateFactor, UsageVal)  
VALUES ('EE0017', 'DAD0017', TO_DATE('171123', 'DDMMYY'), 30, 68.98,0.584, 276);
```

```
INSERT INTO ElectricData (ElectricityId, Participant_Id, SubmitDate, NumDays,  
CurrentChargeRM, ProrateFactor, UsageVal)  
VALUES ('EE0018', 'DAC0018', TO_DATE('111123', 'DDMMYY'), 30, 61.64,0.584, 254);
```

```
INSERT INTO ElectricData (ElectricityId, Participant_Id, SubmitDate, NumDays,  
CurrentChargeRM, ProrateFactor, UsageVal)  
VALUES ('EE0019', 'DBA0019', TO_DATE('071123', 'DDMMYY'), 30, 94.03,0.584, 333);
```

```
INSERT INTO ElectricData (ElectricityId, Participant_Id, SubmitDate, NumDays,  
CurrentChargeRM, ProrateFactor, UsageVal)  
VALUES ('EE0020', 'DCE0020', TO_DATE('061123', 'DDMMYY'), 30, 51.95,0.584, 225);
```

-----WaterData-----

```
INSERT INTO WaterData (WaterId, Participant_Id, SubmitDate, NumDays, CurrentChargeRM,  
ProrateFactor, UsageVal)  
VALUES ('WT0001', 'AAA0001', TO_DATE('011123', 'DDMMYY'), 30, 20.00, 0.419, 22);
```

```
INSERT INTO WaterData (WaterId, Participant_Id, SubmitDate, NumDays, CurrentChargeRM,  
ProrateFactor, UsageVal)  
VALUES ('WT0002', 'AAB0002', TO_DATE('011123', 'DDMMYY'), 30, 12.10, 0.419, 15);
```

```
INSERT INTO WaterData (WaterId, Participant_Id, SubmitDate, NumDays, CurrentChargeRM,  
ProrateFactor, UsageVal)  
VALUES ('WT0003', 'ACE0003', TO_DATE('111123', 'DDMMYY'), 30, 18.00, 0.419, 21);
```

```
INSERT INTO WaterData (WaterId, Participant_Id, SubmitDate, NumDays, CurrentChargeRM,
ProrateFactor, UsageVal)
VALUES ('WT0004', 'AAD0004', TO_DATE('101123', 'DDMMYY'), 30,24.30, 0.419, 24);
```

```
INSERT INTO WaterData (WaterId, Participant_Id, SubmitDate, NumDays, CurrentChargeRM,
ProrateFactor, UsageVal)
VALUES ('WT0005', 'ABA0005', TO_DATE('211123', 'DDMMYY'), 30, 15.20, 0.419, 19);
```

```
INSERT INTO WaterData (WaterId, Participant_Id, SubmitDate, NumDays, CurrentChargeRM,
ProrateFactor, UsageVal)
VALUES ('WT0006', 'BAB0006', TO_DATE('021123', 'DDMMYY'), 30, 12.10, 0.419, 15);
```

```
INSERT INTO WaterData (WaterId, Participant_Id, SubmitDate, NumDays, CurrentChargeRM,
ProrateFactor, UsageVal)
VALUES ('WT0007', 'BBA0007', TO_DATE('041123', 'DDMMYY'), 30, 24.30, 0.419, 24);
```

```
INSERT INTO WaterData (WaterId, Participant_Id, SubmitDate, NumDays, CurrentChargeRM,
ProrateFactor, UsageVal)
VALUES ('WT0008', 'BBC0008', TO_DATE('301123', 'DDMMYY'), 30, 16.34, 0.419, 20);
```

```
INSERT INTO WaterData (WaterId, Participant_Id, SubmitDate, NumDays, CurrentChargeRM,
ProrateFactor, UsageVal)
VALUES ('WT0009', 'BAA0009', TO_DATE('131123', 'DDMMYY'), 30, 11.20, 0.419, 14);
```

```
INSERT INTO WaterData (WaterId, Participant_Id, SubmitDate, NumDays, CurrentChargeRM,
ProrateFactor, UsageVal)
VALUES ('WT0010', 'BAC0010', TO_DATE('071123', 'DDMMYY'), 30, 9.60, 0.419, 12);
```

```
INSERT INTO WaterData (WaterId, Participant_Id, SubmitDate, NumDays, CurrentChargeRM,
ProrateFactor, UsageVal)
VALUES ('WT0011', 'CDB0011', TO_DATE('111123', 'DDMMYY'), 30, 46.34, 0.419, 35);
```

```
INSERT INTO WaterData (WaterId, Participant_Id, SubmitDate, NumDays, CurrentChargeRM,
ProrateFactor, UsageVal)
VALUES ('WT0012', 'CCA0012', TO_DATE('171123', 'DDMMYY'), 30, 30.77, 0.419, 27);
```

```
INSERT INTO WaterData (WaterId, Participant_Id, SubmitDate, NumDays, CurrentChargeRM,
ProrateFactor, UsageVal)
VALUES ('WT0013', 'CBA0013', TO_DATE('211123', 'DDMMYY'), 30, 34.12, 0.419, 29);
```

```
INSERT INTO WaterData (WaterId, Participant_Id, SubmitDate, NumDays, CurrentChargeRM,
ProrateFactor, UsageVal)
VALUES ('WT0014', 'CDB0014', TO_DATE('241123', 'DDMMYY'), 30, 38.98, 0.419, 31);
```

```
INSERT INTO WaterData (WaterId, Participant_Id, SubmitDate, NumDays, CurrentChargeRM,
ProrateFactor, UsageVal)
VALUES ('WT0015', 'CCD0015', TO_DATE('231123', 'DDMMYY'), 30, 76.22, 0.419, 45);
```

```
INSERT INTO WaterData (WaterId, Participant_Id, SubmitDate, NumDays, CurrentChargeRM,
ProrateFactor, UsageVal)
VALUES ('WT0016', 'DED0016', TO_DATE('251223', 'DDMMYY'), 30, 61.59, 0.419, 40);
```

```
INSERT INTO WaterData (WaterId, Participant_Id, SubmitDate, NumDays, CurrentChargeRM,
ProrateFactor, UsageVal)
VALUES ('WT0017', 'DAD0017', TO_DATE('171123', 'DDMMYY'), 30, 70.11, 0.419, 43);
```

```
INSERT INTO WaterData (WaterId, Participant_Id, SubmitDate, NumDays, CurrentChargeRM,
ProrateFactor, UsageVal)
VALUES ('WT0018', 'DAC0018', TO_DATE('111123', 'DDMMYY'), 30, 91.23, 0.419, 50);
```

```
INSERT INTO WaterData (WaterId, Participant_Id, SubmitDate, NumDays, CurrentChargeRM,
ProrateFactor, UsageVal)
VALUES ('WT0019', 'DBA0019', TO_DATE('071123', 'DDMMYY'), 30, 49.33, 0.419, 36);
```

```
INSERT INTO WaterData (WaterId, Participant_Id, SubmitDate, NumDays, CurrentChargeRM,
ProrateFactor, UsageVal)
VALUES ('WT0020', 'DCE0020', TO_DATE('061123', 'DDMMYY'), 30, 55.00, 0.419, 38);
```

-----WasteData-----

```
INSERT INTO WasteData (WasteId, Participant_Id, SubmitDate, NumDays, CurrentChargeRM,
WasteMass, OilMass)
VALUES ('WS0001', 'AAA0001', TO_DATE('011123', 'DDMMYY'), 30, 29.09, 2.30, 9.49);
```

```
INSERT INTO WasteData (WasteId, Participant_Id, SubmitDate, NumDays, CurrentChargeRM,
WasteMass, OilMass)
VALUES ('WS0002', 'AAB0002', TO_DATE('011123', 'DDMMYY'), 30, 23.87, 1.40, 7.83);
```

```
INSERT INTO WasteData (WasteId, Participant_Id, SubmitDate, NumDays, CurrentChargeRM,
WasteMass, OilMass)
VALUES ('WS0003', 'ACE0003', TO_DATE('111123', 'DDMMYY'), 30, 18.02, 1.30, 5.89);
```

```
INSERT INTO WasteData (WasteId, Participant_Id, SubmitDate, NumDays, CurrentChargeRM,
WasteMass, OilMass)
VALUES ('WS0004', 'AAD0004', TO_DATE('101123', 'DDMMYY'), 30, 25.07, 5.30, 7.88);
```

```
INSERT INTO WasteData (WasteId, Participant_Id, SubmitDate, NumDays, CurrentChargeRM,
WasteMass, OilMass)
VALUES ('WS0005', 'ABA0005', TO_DATE('211123', 'DDMMYY'), 30, 24.72, 1.32, 8.24);
```

```
INSERT INTO WasteData (WasteId, Participant_Id, SubmitDate, NumDays, CurrentChargeRM,
WasteMass, OilMass)
VALUES ('WS0006', 'BAB0006', TO_DATE('021123', 'DDMMYY'), 30, 18.02, 1.30, 5.89);
```

```
INSERT INTO WasteData (WasteId, Participant_Id, SubmitDate, NumDays, CurrentChargeRM,
WasteMass, OilMass)
VALUES ('WS0007', 'BBA0007', TO_DATE('041123', 'DDMMYY'), 30, 26.25, 5.42, 8.75);
```

```
INSERT INTO WasteData (WasteId, Participant_Id, SubmitDate, NumDays, CurrentChargeRM,
WasteMass, OilMass)
VALUES ('WS0008', 'BBC0008', TO_DATE('301123', 'DDMMYY'), 30, 24.72, 1.32, 8.24);
```

```
INSERT INTO WasteData (WasteId, Participant_Id, SubmitDate, NumDays, CurrentChargeRM,
WasteMass, OilMass)
VALUES ('WS0009', 'BAA0009', TO_DATE('131123', 'DDMMYY'), 30, 26.94, 4.98, 8.98);
```

```
INSERT INTO WasteData (WasteId, Participant_Id, SubmitDate, NumDays, CurrentChargeRM,
WasteMass, OilMass)
VALUES ('WS0010', 'BAC0010', TO_DATE('071123', 'DDMMYY'), 30, 29.55, 3.10, 9.57);
```

```
INSERT INTO WasteData (WasteId, Participant_Id, SubmitDate, NumDays, CurrentChargeRM,
WasteMass, OilMass)
VALUES ('WS0011', 'CDB0011', TO_DATE('111223', 'DDMMYY'), 30, 26.25, 5.42, 8.75);
```

```
INSERT INTO WasteData (WasteId, Participant_Id, SubmitDate, NumDays, CurrentChargeRM,
WasteMass, OilMass)
VALUES ('WS0012', 'CCA0012', TO_DATE('171223', 'DDMMYY'), 30, 29.09, 2.30, 9.49);
```

```
INSERT INTO WasteData (WasteId, Participant_Id, SubmitDate, NumDays, CurrentChargeRM,
WasteMass, OilMass)
VALUES ('WS0013', 'CBA0013', TO_DATE('211123', 'DDMMYY'), 30, 23.94, 5.68, 7.98);
```

```
INSERT INTO WasteData (WasteId, Participant_Id, SubmitDate, NumDays, CurrentChargeRM,
WasteMass, OilMass)
VALUES ('WS0014', 'CDB0014', TO_DATE('241123', 'DDMMYY'), 30, 22.87, 1.70, 7.47);
```

```
INSERT INTO WasteData (WasteId, Participant_Id, SubmitDate, NumDays, CurrentChargeRM,
WasteMass, OilMass)
VALUES ('WS0015', 'CCD0015', TO_DATE('231123', 'DDMMYY'), 30, 29.10, 2.32, 9.49);
```

```
INSERT INTO WasteData (WasteId, Participant_Id, SubmitDate, NumDays, CurrentChargeRM,
WasteMass, OilMass)
VALUES ('WS0016', 'DED0016', TO_DATE('251223', 'DDMMYY'),30, 29.55, 3.10, 9.57);
```

```
INSERT INTO WasteData (WasteId, Participant_Id, SubmitDate, NumDays, CurrentChargeRM,
WasteMass, OilMass)
VALUES ('WS0017', 'DAD0017', TO_DATE('171123', 'DDMMYY'), 30, 18.02, 1.30, 5.89);
```

```
INSERT INTO WasteData (WasteId, Participant_Id, SubmitDate, NumDays, CurrentChargeRM,
WasteMass, OilMass)
VALUES ('WS0018', 'DAC0018', TO_DATE('111123', 'DDMMYY'),30, 26.07, 5.35, 8.69);
```

```
INSERT INTO WasteData (WasteId, Participant_Id, SubmitDate, NumDays, CurrentChargeRM,
WasteMass, OilMass)
VALUES ('WS0019', 'DBA0019', TO_DATE('071123', 'DDMMYY'), 30, 22.01, 1.30, 7.22);
```

```
INSERT INTO WasteData (WasteId, Participant_Id, SubmitDate, NumDays, CurrentChargeRM,
WasteMass, OilMass)
VALUES ('WS0020', 'DCE0020', TO_DATE('061123', 'DDMMYY'),30, 21.51, 1.20, 7.17);
```

-----Calculated_Carbon_Footprint-----

```
INSERT INTO Calculated_Carbon_Footprint (CarbonFootprint_Id, Participant_Id,
ElectricCarbonFootprint, WaterCarbonFootprint, WasteCarbonFootprint, TotalCarbonFootprint)
VALUES ('CF0001', 'AAA0001', 147.75, 9.22, 33.72, 190.69);
```

```
INSERT INTO Calculated_Carbon_Footprint (CarbonFootprint_Id, Participant_Id,
ElectricCarbonFootprint, WaterCarbonFootprint, WasteCarbonFootprint, TotalCarbonFootprint)
VALUES ('CF0002', 'AAB0002', 263.97, 6.29, 26.40, 296.66);
```



```
INSERT INTO Calculated_Carbon_Footprint (CarbonFootprint_Id, Participant_Id,  
ElectricCarbonFootprint, WaterCarbonFootprint, WasteCarbonFootprint, TotalCarbonFootprint)  
VALUES ('CF0003', 'ACE0003', 195.07, 8.80, 22.34, 226.21);
```

```
INSERT INTO Calculated_Carbon_Footprint (CarbonFootprint_Id, Participant_Id,  
ElectricCarbonFootprint, WaterCarbonFootprint, WasteCarbonFootprint, TotalCarbonFootprint)  
VALUES ('CF0004', 'AAD0004', 238.87, 10.06, 37.69, 286.62);
```

```
INSERT INTO Calculated_Carbon_Footprint (CarbonFootprint_Id, Participant_Id,  
ElectricCarbonFootprint, WaterCarbonFootprint, WasteCarbonFootprint, TotalCarbonFootprint)  
VALUES ('CF0005', 'ABA0005', 157.10, 7.96, 23.57, 188.63);
```

```
INSERT INTO Calculated_Carbon_Footprint (CarbonFootprint_Id, Participant_Id,  
ElectricCarbonFootprint, WaterCarbonFootprint, WasteCarbonFootprint, TotalCarbonFootprint)  
VALUES ('CF0006', 'BAB0006', 242.36, 6.29, 20.56, 269.21);
```

```
INSERT INTO Calculated_Carbon_Footprint (CarbonFootprint_Id, Participant_Id,  
ElectricCarbonFootprint, WaterCarbonFootprint, WasteCarbonFootprint, TotalCarbonFootprint)  
VALUES ('CF0007', 'BBA0007', 168.78, 10.06, 25.03, 203.87);
```

```
INSERT INTO Calculated_Carbon_Footprint (CarbonFootprint_Id, Participant_Id,  
ElectricCarbonFootprint, WaterCarbonFootprint, WasteCarbonFootprint, TotalCarbonFootprint)  
VALUES ('CF0008', 'BBC0008', 179.29, 8.38, 12.01, 199.68);
```

```
INSERT INTO Calculated_Carbon_Footprint (CarbonFootprint_Id, Participant_Id,  
ElectricCarbonFootprint, WaterCarbonFootprint, WasteCarbonFootprint, TotalCarbonFootprint)  
VALUES ('CF0009', 'BAA0009', 172.86, 5.87, 25.68, 204.41);
```

```
INSERT INTO Calculated_Carbon_Footprint (CarbonFootprint_Id, Participant_Id,  
ElectricCarbonFootprint, WaterCarbonFootprint, WasteCarbonFootprint, TotalCarbonFootprint)  
VALUES ('CF0010', 'BAC0010', 168.19, 5.03, 36.24, 209.46);
```

```
INSERT INTO Calculated_Carbon_Footprint (CarbonFootprint_Id, Participant_Id,  
ElectricCarbonFootprint, WaterCarbonFootprint, WasteCarbonFootprint, TotalCarbonFootprint)  
VALUES ('CF0011', 'CDB0011', 143.08, 14.67, 9.44, 167.19);
```

```
INSERT INTO Calculated_Carbon_Footprint (CarbonFootprint_Id, Participant_Id,  
ElectricCarbonFootprint, WaterCarbonFootprint, WasteCarbonFootprint, TotalCarbonFootprint)  
VALUES ('CF0012', 'CCA0012', 186.88, 11.31, 32.11, 230.30);
```

```
INSERT INTO Calculated_Carbon_Footprint (CarbonFootprint_Id, Participant_Id,  
ElectricCarbonFootprint, WaterCarbonFootprint, WasteCarbonFootprint, TotalCarbonFootprint)  
VALUES ('CF0013', 'CBA0013', 130.23, 12.15, 22.82, 165.20);
```

```
INSERT INTO Calculated_Carbon_Footprint (CarbonFootprint_Id, Participant_Id,  
ElectricCarbonFootprint, WaterCarbonFootprint, WasteCarbonFootprint, TotalCarbonFootprint)  
VALUES ('CF0014', 'CDB0014', 169.36, 12.99, 26.23, 208.58);
```

```
INSERT INTO Calculated_Carbon_Footprint (CarbonFootprint_Id, Participant_Id,  
ElectricCarbonFootprint, WaterCarbonFootprint, WasteCarbonFootprint, TotalCarbonFootprint)  
VALUES ('CF0015', 'CCD0015', 185.71, 18.86, 10.58, 215.15);
```

```
INSERT INTO Calculated_Carbon_Footprint (CarbonFootprint_Id, Participant_Id,  
ElectricCarbonFootprint, WaterCarbonFootprint, WasteCarbonFootprint, TotalCarbonFootprint)  
VALUES ('CF0016', 'DED0016', 134.32, 16.76, 12.00, 163.08);
```

```
INSERT INTO Calculated_Carbon_Footprint (CarbonFootprint_Id, Participant_Id,  
ElectricCarbonFootprint, WaterCarbonFootprint, WasteCarbonFootprint, TotalCarbonFootprint)  
VALUES ('CF0017', 'DAD0017', 161.18, 18.02, 12.01, 191.21);
```

```
INSERT INTO Calculated_Carbon_Footprint (CarbonFootprint_Id, Participant_Id,  
ElectricCarbonFootprint, WaterCarbonFootprint, WasteCarbonFootprint, TotalCarbonFootprint)  
VALUES ('CF0018', 'DAC0018', 148.37, 20.95, 24.85, 194.17);
```

```
INSERT INTO Calculated_Carbon_Footprint (CarbonFootprint_Id, Participant_Id,  
ElectricCarbonFootprint, WaterCarbonFootprint, WasteCarbonFootprint, TotalCarbonFootprint)  
VALUES ('CF0019', 'DBA0019', 194.47, 15.08, 24.37, 233.92);
```

```
INSERT INTO Calculated_Carbon_Footprint (CarbonFootprint_Id, Participant_Id,  
ElectricCarbonFootprint, WaterCarbonFootprint, WasteCarbonFootprint, TotalCarbonFootprint)  
VALUES ('CF0020', 'DCE0020', 131.40, 15.92, 20.51, 167.83);
```

-----Carbon_Footprint_Mapping-----

```
INSERT INTO Carbon_Footprint_Mapping (Mapping_Id, CarbonFootprint_Id, EmissionLevel,  
Geographical_Location)  
VALUES ('MP0001', 'CF0001', 'Moderate', 'Jalan Pahlawan 2');
```

```
INSERT INTO Carbon_Footprint_Mapping (Mapping_Id, CarbonFootprint_Id, EmissionLevel,
Geograpichal_Location)
VALUES ('MP0002', 'CF0002', 'High', 'Jalan Perwira 1');
```

```
INSERT INTO Carbon_Footprint_Mapping (Mapping_Id, CarbonFootprint_Id, EmissionLevel,
Geograpichal_Location)
VALUES ('MP0003', 'CF0003', 'High', 'Jalan Perwira 17');
```

```
INSERT INTO Carbon_Footprint_Mapping (Mapping_Id, CarbonFootprint_Id, EmissionLevel,
Geograpichal_Location)
VALUES ('MP0004', 'CF0004', 'High', 'Jalan Layang 16');
```

```
INSERT INTO Carbon_Footprint_Mapping (Mapping_Id, CarbonFootprint_Id, EmissionLevel,
Geograpichal_Location)
VALUES ('MP0005', 'CF0005', 'Moderate', 'Jalan Naknob 12');
```

```
INSERT INTO Carbon_Footprint_Mapping (Mapping_Id, CarbonFootprint_Id, EmissionLevel,
Geograpichal_Location)
VALUES ('MP0006', 'CF0006', 'High', 'Jalan Bentara 20');
```

```
INSERT INTO Carbon_Footprint_Mapping (Mapping_Id, CarbonFootprint_Id, EmissionLevel,
Geograpichal_Location)
VALUES ('MP0007', 'CF0007', 'Moderate', 'Jalan Perwira 18');
```

```
INSERT INTO Carbon_Footprint_Mapping (Mapping_Id, CarbonFootprint_Id, EmissionLevel,
Geograpichal_Location)
VALUES ('MP0008', 'CF0008', 'Moderate', 'Jalan Ronggeng 12');
```

```
INSERT INTO Carbon_Footprint_Mapping (Mapping_Id, CarbonFootprint_Id, EmissionLevel,
Geograpichal_Location)
VALUES ('MP0009', 'CF0009', 'Moderate', 'Jalan Uda 15');
```

```
INSERT INTO Carbon_Footprint_Mapping (Mapping_Id, CarbonFootprint_Id, EmissionLevel,
Geograpichal_Location)
VALUES ('MP0010', 'CF0010', 'Moderate', 'Jalan Impian 5/2');
```

```
INSERT INTO Carbon_Footprint_Mapping (Mapping_Id, CarbonFootprint_Id, EmissionLevel,
Geograpichal_Location)
VALUES ('MP0011', 'CF0011', 'Low', 'Jalan Sutera 8/4');
```

```
INSERT INTO Carbon_Footprint_Mapping (Mapping_Id, CarbonFootprint_Id, EmissionLevel,
Geograpichal_Location)
VALUES ('MP0012', 'CF0012', 'Moderate', 'Jalan Persiaran 2');
```

```
INSERT INTO Carbon_Footprint_Mapping (Mapping_Id, CarbonFootprint_Id, EmissionLevel,
Geograpichal_Location)
VALUES ('MP0013', 'CF0013', 'Low', 'Jalan Budaya 1');
```

```
INSERT INTO Carbon_Footprint_Mapping (Mapping_Id, CarbonFootprint_Id, EmissionLevel,
Geograpichal_Location)
VALUES ('MP0014', 'CF0014', 'Moderate', 'Jalan Muri 1/9');
```

```
INSERT INTO Carbon_Footprint_Mapping (Mapping_Id, CarbonFootprint_Id, EmissionLevel,
Geograpichal_Location)
VALUES ('MP0015', 'CF0015', 'Moderate', 'Jalan Medani 8');
```

```
INSERT INTO Carbon_Footprint_Mapping (Mapping_Id, CarbonFootprint_Id, EmissionLevel,
Geograpichal_Location)
VALUES ('MP0016', 'CF0016', 'Low', 'Jalan Indah 16/8');
```

```
INSERT INTO Carbon_Footprint_Mapping (Mapping_Id, CarbonFootprint_Id, EmissionLevel,
Geograpichal_Location)
VALUES ('MP0017', 'CF0017', 'Moderate', 'Jalan NusaJaya 1/1');
```

```
INSERT INTO Carbon_Footprint_Mapping (Mapping_Id, CarbonFootprint_Id, EmissionLevel,
Geograpichal_Location)
VALUES ('MP0018', 'CF0018', 'Moderate', 'Jalan Indah 28/1');
```

```
INSERT INTO Carbon_Footprint_Mapping (Mapping_Id, CarbonFootprint_Id, EmissionLevel,
Geograpichal_Location)
VALUES ('MP0019', 'CF0019', 'High', 'Jalan Bestari 5/5');
```

```
INSERT INTO Carbon_Footprint_Mapping (Mapping_Id, CarbonFootprint_Id, EmissionLevel,
Geograpichal_Location)
VALUES ('MP0020', 'CF0020', 'Low', 'Jalan Nusia 11/7');
```

MBIP

```
INSERT INTO MBIP (Staff_Id, Name, Email, TelephoneNo)
VALUES ('MB0001', 'Suhaila Auni', 'Auni212@gmail.com', 0195548294);
```

```
INSERT INTO MBIP (Staff_Id, Name, Email, TelephoneNo)
VALUES ('MB0002', 'Rashi Sulai', 'Sulai345@gmail.com', 0174495427);
```

```
INSERT INTO MBIP (Staff_Id, Name, Email, TelephoneNo)
VALUES ('MB0003', 'Abu Omar', 'Omar211@gmail.com', 0114658708);
```

```
INSERT INTO MBIP (Staff_Id, Name, Email, TelephoneNo)
VALUES ('MB0004', 'Murta Kwek', 'Murta090@gmail.com', 0193344769);
```

```
INSERT INTO MBIP (Staff_Id, Name, Email, TelephoneNo)
VALUES ('MB0005', 'Raasush', 'Raasush678@gmail.com', 0194547599);
```

```
INSERT INTO MBIP (Staff_Id, Name, Email, TelephoneNo)
VALUES ('MB0006', 'Tinessh', 'Tinessh344@gmail.com', 0137740673);
```

```
INSERT INTO MBIP (Staff_Id, Name, Email, TelephoneNo)
VALUES ('MB0007', 'Kew Leng Siam', 'LengSiam122@gmail.com', 0105476987);
```

```
INSERT INTO MBIP (Staff_Id, Name, Email, TelephoneNo)
VALUES ('MB0008', 'Ibrahim Oji', 'Oji123@gmail.com', 0172237596);
```

```
INSERT INTO MBIP (Staff_Id, Name, Email, TelephoneNo)
VALUES ('MB0009', 'Shahilda Sum', 'Sum909@gmail.com', 0101139476);
```

```
INSERT INTO MBIP (Staff_Id, Name, Email, TelephoneNo)
VALUES ('MB0010', 'Omar Ausak', 'Ausak8999@gmail.com', 0145475870);
```

-----Update Row in Table -----

```
UPDATE Participant
SET TelephoneNo = 0137584768
WHERE Participant_Id = 'AAA0001';
```

```
SELECT Participant_Id AS "Participant ID", Name AS "Participant Name", TelephoneNo AS
"New Telephone Number"
FROM Participant
WHERE Participant_Id = 'AAA0001';
```

Participant ID	Participant Name	New Telephone Number
AAA0001	Ahmad Aiman	137584768

-----Delete Row in Table -----

```
DELETE
FROM MBIP
WHERE Staff_Id = 'MB0001';
```

Results Explain Describe Saved SQL History			
STAFF_ID	NAME	EMAIL	TELEPHONENO
MB0002	Rashi Sulai	Sulai345@gmail.com	174495427
MB0003	Abu Omar	Omar211@gmail.com	114658708
MB0004	Murta Kwek	Murta090@gmail.com	193344769
MB0005	Raasush	Raasush678@gmail.com	194547599
MB0006	Tinessh	Tinessh344@gmail.com	137740673
MB0007	Kew Leng Siam	LengSiam122@gmail.com	105476987
MB0008	Ibrahim Oji	Oji123@gmail.com	172237596
MB0009	Shahilda Sum	Sum909@gmail.com	101139476
MB0010	Omar Ausak	Ausak8999@gmail.com	145475870

-----Display Row using IN Operator-----

```
SELECT * FROM Carbon_Footprint_Mapping
WHERE EmissionLevel IN ('High') ;
```

MAPPING_ID	CARBONFOOTPRINT_ID	EMISSIONLEVEL	GEOGRAPICAL_LOCATION
MP0002	CF0002	High	Jalan Perwira 1
MP0003	CF0003	High	Jalan Perwira 17
MP0004	CF0004	High	Jalan Layang 16
MP0006	CF0006	High	Jalan Bentara 20
MP0019	CF0019	High	Jalan Bestari 5/5

-----Display Row using LIKE and AND Operator-----

```
SELECT * FROM MBIP
WHERE Name LIKE 'R%'
AND Email LIKE 'R%';
```

STAFF_ID	NAME	EMAIL	TELEPHONENO
MB0005	Raasush	Raasush678@gmail.com	194547599

-----Display Row using JOIN with the ON Clause-----

```
SELECT p.Participant_Id AS "Participant ID", p.Name AS "Name", p.Email AS "Email",
p.TelephoneNo AS "Telephone Number", c.CarbonFootprint_Id AS "Carbon Footprint ID",
c.TotalCarbonFootprint AS "Total Carbon Footprint"
FROM Participant p JOIN Calculated_Carbon_Footprint c
ON (p.Participant_Id = c.Participant_Id);
```

Participant ID	Name	Email	Telephone Number	Carbon Footprint ID	Total Carbon Footprint
AAA0001	Ahmad Alman	Alman113@gmail.com	102437890	CF0001	190.69
AAB0002	Veena Kaur	Veena112@gmail.com	102345609	CF0002	296.66
ACE0003	Wong Shi Qi	ShiQi117@gmail.com	115679645	CF0003	226.21
AAD0004	Koh Kai Zuan	KaiZuan@gmail.com	178994620	CF0004	286.62
ABA0005	Sharvin Kumar	Sharvin@gmail.com	195212320	CF0005	188.63
BAB0006	Siti Amzah	Siti316@gmail.com	106543480	CF0006	269.21
BBA0007	Kuan Tong Ji	KuanJi214@gmail.com	119873434	CF0007	203.87
BBC0008	Lee Hui Wen	HuiWen221@gmail.com	111475555	CF0008	199.68
BAA0009	Tan Jian Heng	TanHeng@gmail.com	197416784	CF0009	204.41
BAC0010	Al Safa	Safa703@gmail.com	172587457	CF0010	209.46
CDB0011	Mullai Kordy	Mullai@gmail.com	178522345	CF0011	167.19
CCA0012	Lim Zi Qin	ZiQin004@gmail.com	103694534	CF0012	230.3
CBA0013	Shila Haliza	Shila030@gmail.com	106390875	CF0013	165.2
CDB0014	Ven Suci	Ven1@gmail.com	192550453	CF0014	208.58
CCD0015	Kew Ding Shan	DingShan@gmail.com	173433246	CF0015	215.15
DED0016	Alif Alman	Alif@gmail.com	118992342	CF0016	163.08
DAD0017	Ryan Singh	Ryan@gmail.com	109877859	CF0017	191.21
DAC0018	Nik Zulaikha	Zul@gmail.com	116543454	CF0018	194.17
DBA0019	Mou Tak Ding	TakDing@gmail.com	113210753	CF0019	233.92
DCE0020	Nur Haslina	Haslina@gmail.com	171193455	CF0020	167.83

-----Display Row using Literal Character Strings and JOIN and ORDER with the ON Clause-----

```
SELECT p.Name || 's electric, water and waste consumption consist of ' ||
c.ElectricCarbonFootprint || ', ' || c.WaterCarbonFootprint || ', and ' || c.WasteCarbonFootprint || '
carbon footprint respectively, sums up to a total of ' || c.TotalCarbonFootprint || 'kgCO2.' AS
"Participant Information"
FROM Participant p JOIN Calculated_Carbon_Footprint c
ON (p.Participant_Id = c.Participant_Id)
ORDER BY p.Name;
```

Participant Information
Al Safa's electric, water and waste consumption consist of 168.19, 5.03, and 36.24 carbon footprint respectively, sums up to a total of 209.46kgCO ₂ .
Ahmad Alman's electric, water and waste consumption consist of 147.75, 9.22, and 33.72 carbon footprint respectively, sums up to a total of 190.69kgCO ₂ .
Alif Almar's electric, water and waste consumption consist of 134.32, 16.76, and 12 carbon footprint respectively, sums up to a total of 163.08kgCO ₂ .
Kew Ding Shan's electric, water and waste consumption consist of 185.71, 18.86, and 10.58 carbon footprint respectively, sums up to a total of 215.15kgCO ₂ .
Koh Kai Zuan's electric, water and waste consumption consist of 238.87, 10.06, and 37.69 carbon footprint respectively, sums up to a total of 286.62kgCO ₂ .
Kuan Tong Ji's electric, water and waste consumption consist of 168.78, 10.06, and 25.03 carbon footprint respectively, sums up to a total of 203.87kgCO ₂ .
Lee Hui Wen's electric, water and waste consumption consist of 179.29, 8.38, and 12.01 carbon footprint respectively, sums up to a total of 199.68kgCO ₂ .
Lim Zi Qin's electric, water and waste consumption consist of 186.88, 11.31, and 32.11 carbon footprint respectively, sums up to a total of 230.3kgCO ₂ .
Mou Tak Ding's electric, water and waste consumption consist of 194.47, 15.08, and 24.37 carbon footprint respectively, sums up to a total of 233.92kgCO ₂ .
Mullai Kordy's electric, water and waste consumption consist of 143.08, 14.67, and 9.44 carbon footprint respectively, sums up to a total of 167.19kgCO ₂ .
Nik Zulaikha's electric, water and waste consumption consist of 148.37, 20.95, and 24.85 carbon footprint respectively, sums up to a total of 194.17kgCO ₂ .
Nur Haslina's electric, water and waste consumption consist of 131.4, 15.92, and 20.51 carbon footprint respectively, sums up to a total of 167.83kgCO ₂ .
Ryan Singh's electric, water and waste consumption consist of 161.18, 18.02, and 12.01 carbon footprint respectively, sums up to a total of 191.21kgCO ₂ .
Sharvin Kumar's electric, water and waste consumption consist of 157.1, 7.96, and 23.57 carbon footprint respectively, sums up to a total of 188.63kgCO ₂ .
Shila Haliza's electric, water and waste consumption consist of 130.23, 12.15, and 22.82 carbon footprint respectively, sums up to a total of 165.2kgCO ₂ .
Siti Amzah's electric, water and waste consumption consist of 242.36, 6.29, and 20.56 carbon footprint respectively, sums up to a total of 269.21kgCO ₂ .
Tan Jian Heng's electric, water and waste consumption consist of 172.86, 5.87, and 25.68 carbon footprint respectively, sums up to a total of 204.41kgCO ₂ .
Veena Kaur's electric, water and waste consumption consist of 263.97, 6.29, and 26.4 carbon footprint respectively, sums up to a total of 296.66kgCO ₂ .
Ven Sud's electric, water and waste consumption consist of 169.36, 12.99, and 26.23 carbon footprint respectively, sums up to a total of 208.58kgCO ₂ .
Wong Shi Qi's electric, water and waste consumption consist of 195.07, 8.8, and 22.34 carbon footprint respectively, sums up to a total of 226.21kgCO ₂ .

-----Display Row using WHERE Clause-----

```
SELECT ElectricityId AS "Electricity ID", Participant_Id AS "Participant ID", SubmitDate AS
"Submit Date", CurrentChargeRM AS "Current Charge RM", UsageVal "Usage Value"
FROM ElectricData
WHERE UsageVal >300;
```

Electricity ID	Participant ID	Submit Date	Current Charge RM	Usage Value
EE0002	AAB0002	11/01/2023	155.43	452
EE0003	ACE0003	11/11/2023	94.54	334
EE0004	AAD0004	11/10/2023	133.24	409
EE0006	BAB0006	11/02/2023	136.34	415
EE0008	BBC0008	11/30/2023	80.61	307
EE0012	CCA0012	12/17/2023	87.32	320
EE0015	CCD0015	11/23/2023	86.29	318
EE0019	DBA0019	11/07/2023	94.03	333

-----Display Row using BETWEEN Operator-----

```
SELECT *
FROM Calculated_Carbon_Footprint
WHERE TotalCarbonFootprint BETWEEN 180 AND 220;
```

CARBONFOOTPRINT_ID	PARTICIPANT_ID	ELECTRICCARBONFOOTPRINT	WATERCARBONFOOTPRINT	WASTECARBONFOOTPRINT	TOTALCARBONFOOTPRINT
CF0001	AAA0001	147.75	9.22	33.72	190.69
CF0005	ABA0005	15.71	7.96	23.57	188.63
CF0007	BBA0007	168.78	10.06	25.03	203.87
CF0008	BBC0008	179.29	8.38	12.01	199.68
CF0009	BAA0009	172.86	5.87	25.68	204.41
CF0010	BAC0010	168.19	5.03	36.24	209.46
CF0014	CDB0014	169.36	12.99	26.23	208.58
CF0015	CCD0015	185.71	18.86	10.58	215.15
CF0017	DAD0017	161.18	18.02	12.01	191.21
CF0018	DAC0018	148.37	20.95	24.85	194.17

-----Display Row using ORDER by Clause-----

```
SELECT Participant_Id AS "Participant ID", Participant_ICNumber AS "IC",
Participant_BirthDate AS "Birth Date", Participant_Gender AS "Gender", Participant_Address
AS "Address", Name AS "Name", Username AS "Username", Password AS "Password",
Email AS "Email", TelephoneNo AS "Telephone Number"
FROM Participant
ORDER BY Name;
```

Participant ID	IC	Birth Date	Gender	Address	Name	Username	Password	Email	Telephone Number
BAC0010	990703012935	07/03/2099	Male	Jalan Implan 5/2	Al Safa	Safa703	Al9907	Safa703@gmail.com	172587457
AAA0001	970120011113	01/20/2097	Male	Jalan Pahlawan 2	Ahmad Alman	Alman113	Ahmad9701	Alman113@gmail.com	102437890
DED0016	812014645	08/12/2000	Male	Jalan Indah 16/8	Alif Alman	Alif812	Alman0008	Alif@gmail.com	118992342
CCD0015	940312015465	03/12/2094	Male	Jalan Medani 8	Kew Ding Shan	DingShan312	Kew9403	DingShan@gmail.com	173433246
AAD0004	970218014323	02/18/2097	Male	Jalan Layang 16	Koh Kai Zuan	KaiZuan218	Koh9702	KaiZuan@gmail.com	178994620
BBA0007	850214019403	02/14/2085	Male	Jalan Perwira 18	Kuan Tong Ji	KuanJi214	Tong8502	KuanJi214@gmail.com	119873434
BBC0008	960221013403	02/21/2096	Female	Jalan Ronggeng 12	Lee Hui Wen	HuiWen221	Lee9602	HuiWen221@gmail.com	111475555
CCA0012	921004015646	10/04/2092	Female	Jalan Periaran 2	Lim Zi Qin	ZiQin004	Lim9210	ZiQin004@gmail.com	103694534
DBA0019	519015337	05/19/2000	Male	Jalan Bestari 5/5	Mou Tak Ding	TakDing519	Mou0005	TakDing@gmail.com	113210753
CD00011	900803014323	08/03/2090	Female	Jalan Sutera 8/4	Mullai Kordy	Mullai803	Kordy9008	Mullai@gmail.com	178522345
DAC0018	990617012432	06/17/2099	Female	Jalan Indah 28/1	Nik Zulalika	Zul617	Nik9906	Zul@gmail.com	116543454
DCE0020	940509013454	05/09/2094	Female	Jalan Nusia 11/7	Nur Haslina	Haslina509	Nur9405	Haslina@gmail.com	171193455
DAD0017	10714018687	07/14/2001	Male	Jalan NusaJaya 1/1	Ryan Singh	Ryan714	Singh0107	Ryan@gmail.com	109877859
ABA0005	880317012325	03/17/2088	Male	Jalan Naknob 12	Sharvin Kumar	Sharvin317	Kumar8803	Sharvin@gmail.com	193212320
CBA0013	861030013422	10/30/2086	Female	Jalan Budaya 1	Shila Haliza	Shila030	Haliza8610	Shila030@gmail.com	106390875
BAB0006	870316013456	03/16/2087	Female	Jalan Bentara 20	Siti Amzah	Siti316	Amzah8703	Siti316@gmail.com	106543480
BAA0009	990420013453	04/20/2099	Male	Jalan Uda 15	Tan Jian Heng	TanHeng420	Jian9904	TanHeng@gmail.com	197416784
AAB0002	980121011112	01/21/2098	Female	Jalan Perwira 1	Veena Kaur	Veena112	Kaur9801	Veena112@gmail.com	102345609
CD00014	881126016575	11/26/2088	Male	Jalan Muri 1/9	Ven Suci	Ven126	Suci8811	Ven1@gmail.com	192550453
ACE0003	980117011018	01/17/2098	Female	Jalan Perwira 17	Wong Shi Qi	ShiQi117	Wong9801	ShiQi117@gmail.com	115679645

-----Display Row using Substitution Variable-----

```
SELECT Participant_Id, Participant_ICNumber, Participant_BirthDate, Participant_Address,
Name, TelephoneNo
FROM Participant
WHERE Participant_Gendar = :Gender;
```

Bind Variable	Value
:GENDER	<input type="text" value="Male"/>

PARTICIPANT_ID	PARTICIPANT_ICNUMBER	PARTICIPANT_BIRTHDATE	PARTICIPANT_ADDRESS	NAME	TELEPHONENO
AAA0001	970120011113	01/20/2097	Jalan Pahlawan 2	Ahmad Aiman	137584768
AAD0004	970218014323	02/18/2097	Jalan Layang 16	Koh Kai Zuan	178994620
ABA0005	880317012325	03/17/2088	Jalan Naknob 12	Sharvin Kumar	193212320
BBA0007	850214019403	02/14/2085	Jalan Perwira 18	Kuan Tong Ji	119873434
BAA0009	990420013453	04/20/2099	Jalan Uda 15	Tan Jian Heng	197416784
BAC0010	990703012935	07/03/2099	Jalan Impian 5/2	Al Safa	172587457
CDB0014	881126016575	11/26/2088	Jalan Muri 1/9	Ven Suci	192550453
CCD0015	940312015465	03/12/2094	Jalan Medani 8	Kew Ding Shan	173433246
DED0016	812014645	08/12/2000	Jalan Indah 16/8	Alif Aiman	118992342

-----Display Row using Comparison Operators-----

```

SELECT p.Participant_Id AS "Participant ID" , e.UsageVal AS "Electric Consumption",
wt.UsageVal AS "Water usage" , ws.WasteMass+ws.OilMass AS "Waste", e.SubmitDate AS
"Submit Date"
FROM Participant p JOIN ElectricData e ON (p.Participant_Id = e.Participant_Id)
JOIN WaterData wt ON (p.Participant_Id = wt.Participant_Id)
JOIN WasteData ws ON (p.Participant_Id = ws.Participant_Id)
WHERE e.SubmitDate < TO_DATE('15/11/23', 'DD/MM/YY');

```

Participant ID	Electric Consumption	Water usage	Waste	Submit Date
AAA0001	253	22	11.79	11/01/2023
AAB0002	452	15	9.23	11/01/2023
ACE0003	334	21	7.19	11/11/2023
AAD0004	409	24	13.18	11/10/2023
BAB0006	415	15	7.19	11/02/2023
BBA0007	289	24	14.17	11/04/2023
BAA0009	296	14	13.96	11/13/2023
BAC0010	288	12	12.67	11/07/2023
DAC0018	254	50	14.04	11/11/2023
DBA0019	333	36	8.52	11/07/2023
DCE0020	225	38	8.37	11/06/2023

7.0 Interface

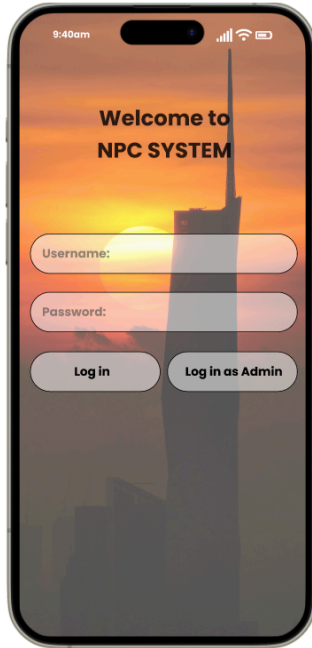


Figure 1: Participant Login Page

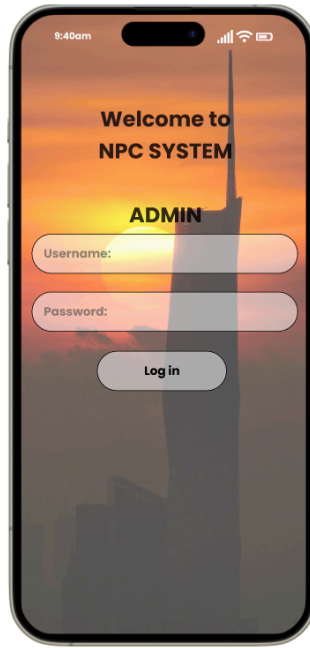


Figure 2: Admin Login Page

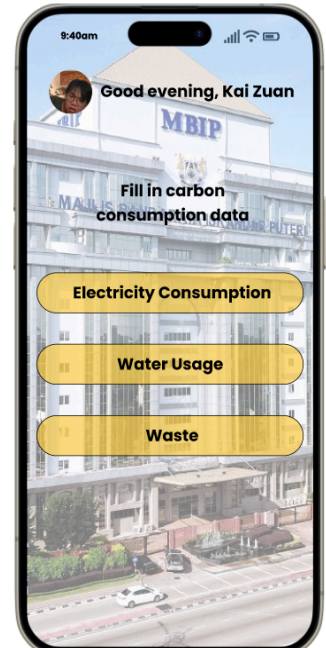


Figure 3: Main Page

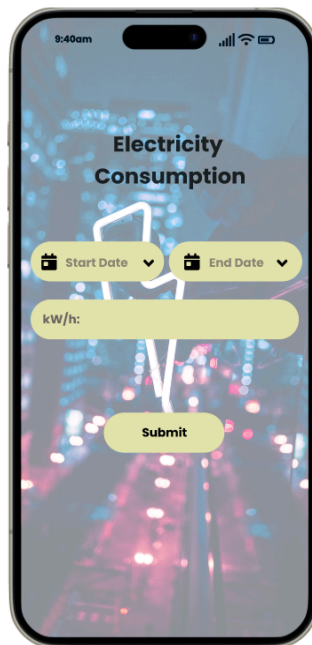


Figure 4: Input Electric Consumption

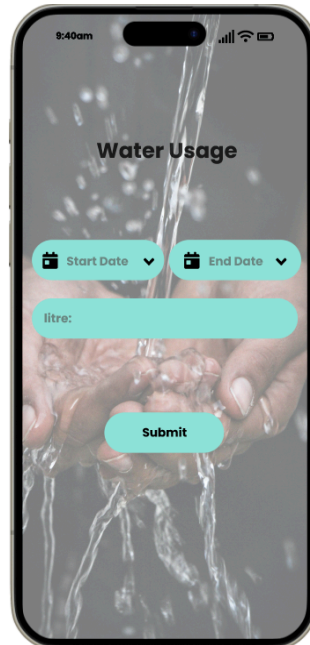


Figure 5: Input Water Usage

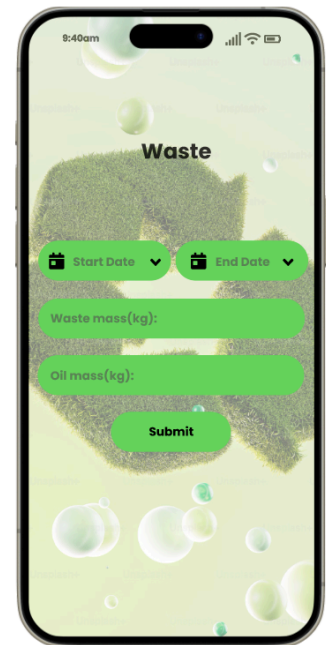


Figure 6: Input Waste Data

8.0 Summary

In this phase 3 document, the database logical design and the SQL implementation of the SUSTAINCONNECT.JOHORDB have been documented. The conceptual entity relationship diagram (ERD) in phase 2 is transformed into a logical ERD by determining the functional dependencies between the relationships based on the updated business rules. Next, the relational DB schema is generated from the existing logical ERD by performing normalization from the first normal form (1NF) to the Boyce-Codd normal form (BCNF). This aims to eliminate data redundancy by organizing information into separate tables, which reduces the risk of inconsistencies and update anomalies. In addition, normalization ensures data integrity, making databases less susceptible to anomalies like insertion, update, and deletion errors.

Furthermore, the data dictionary is updated based on the normalized relations. It is paramount to update the data dictionary from time to time, as it provides entities with attributes, relationships, descriptions, data types, and also constraints. Hence, the data dictionary is able to assist us when creating tables using SQL statements.

In a nutshell, our group hopes that this database system will be able to assist the stakeholders in sorting and organizing important information systematically and consistently.