

Islington College



Databases CC5051NI

Coursework

Submitted By:

Prayash Bikram Shah (16033180)

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Submitted To:

Mr. Prashant Lal Shrestha

Mr. Aadesh Tandukar

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1.Introduction of the Company



Figure 1 Logo of Shree Airlines (Shree Airlines Pvt. Ltd., 2008)

Shree Airlines is one of the domestic airlines of Nepal which was incorporated in 1999. This airline is one of the first private company to start operation of chartered helicopter services too. This airline Shree Airlines, already a pioneer in Air travel is one of the first private airlines in Nepal to operate chartered helicopter services. After being one of the first and largest operator of Mi-47 helicopters in south east Asia, this company has now started a first-class domestic flying experience in Nepal. This airline has started its domestic flying with a Jet Aircraft known as Bombardier CRJ. (Shree Airlines Pvt. Ltd., 2008)

According to the website of Shree airlines, its mission is: *"In the life of every nation comes a moment in time when things can no longer stay the same. It is now this time in our Country, when Nepal looks up, towards its skies, and catches a glimpse of a new promise. As Shree Airlines expands its fleet to include both Helicopter services and Fixed Wing services our mission is to constantly conquer new highs and bring to Nepal, air travel of a new, global standard."* (Shree Airlines Pvt. Ltd, 2008)

This airline has provided the flying experience to a new level and building up its market company promises to bring greater flying experience to Nepal with more quality in its fleet and services. (Shree Airlines Pvt. Ltd., 2008)

1.1 Business Activities and Operations

Air Ananya was the origin name of this airline company which was named after the granddaughter of the owner. The main Key persons of this company are Mr. Banwari Lal Mittal who is the Executive Chairman and Mr. Anil Manandhar who is the corporate manager of the airline. This airline first started with three destinations from Kathmandu which are Bhairawa, Nepalgunj and Dhangadi. Later two more destinations were added to the list which were Biratnagar and Bhadrapur. These five destinations are only the places this airline provides its services to. (Shree Airlines Pvt. Ltd, 2008)

Shree Airline started its domestic passenger service in Nepal with turbo-jet airplanes Bombardier CRJ aircrafts which are Bombardier CRJ 200 and CRJ 700 that were made in Canada. These aircraft provide the new high technology of flying experience and a faster travel than another domestic airline company that are available in Nepal. (Shree Airlines Pvt. Ltd, 2008)



Figure 2 Aircraft of Shree Airlines (Shree Airlines Pvt. Ltd., 2008)

Every Airline has its own fare policies making the types of fare for the customers which can be refundable or non-refundable or with some extra perks. The classes of the fares are H, I, B, E, S and T class with perks of their own. (Shree Airlines Pvt. Ltd, 2008)

Shree Airlines has a High Flyer Club for frequent passenger using Shree Airlines. Below figure shows the breakdown of points for the ticket they travel and those each type of card acquired by the passenger has its advantages like free cancellation, discount rates and also some extra baggage capacity. (Shree Airlines Pvt. Ltd, 2008)

Silver				Gold			
Sector/Class	H (Flexi)	I (Classic)	B (Special)	H (Flexi)	I (Classic)	B (Special)	Reward Points
Bhairahawa	240	150	60	265	265	70	2100
Biratnagar	280	180	65	300	200	75	2500
Bhadrapur	295	195	75	325	215	85	2600
Nepalgunj	435	285	100	480	315	110	3700
Dhangadhi	700	460	170	770	505	190	6000
Mountain Flight	450	-	-	500	-	-	4000

Figure 3 Frequent flyer club Reward points (Shree Airlines Pvt. Ltd, 2008)

1.2 Business Rules

All the Business Rules are:

Passenger:

1. The discounted tickets are non-refundable tickets.
2. If a passenger wants to refund his/her normal tickets then 5% of the fare is charged.
3. A personal identity is required by the airline at the airport.
4. Total Baggage capacity per person is 20 Kg.
5. Passenger needs to report to the airport 45 minutes before flight schedule.
6. No edible stuffs are allowed to carry inside the aircraft.

Employee:

1. All the employees need to report to the airport at 6 am in the morning and should be staying till the last arrival or departure of the flight in the particular day.
2. Employees need to write an application to notify the airline to leave the job before two months at least.
3. Employees get two tickets of both way to all available destination in a year.
4. If one of the employee wants to travel through the airlines on his own cost then they are allowed 15% discount on the air fare.

5. A pension is available to all the employees after 30 years of service.

(Shree Airlines Pvt. Ltd, 2008)

2.Database Design

2.1 Attributes and Entities

Passenger (Customer_ID, Customer_Name, Email, Maling_Address, Contact_no, Gender, {Departure, Destination, Ticket_Status, Flight_No, Fare, Customer Status, Date, Flight_duration})

2.2 ER Diagram

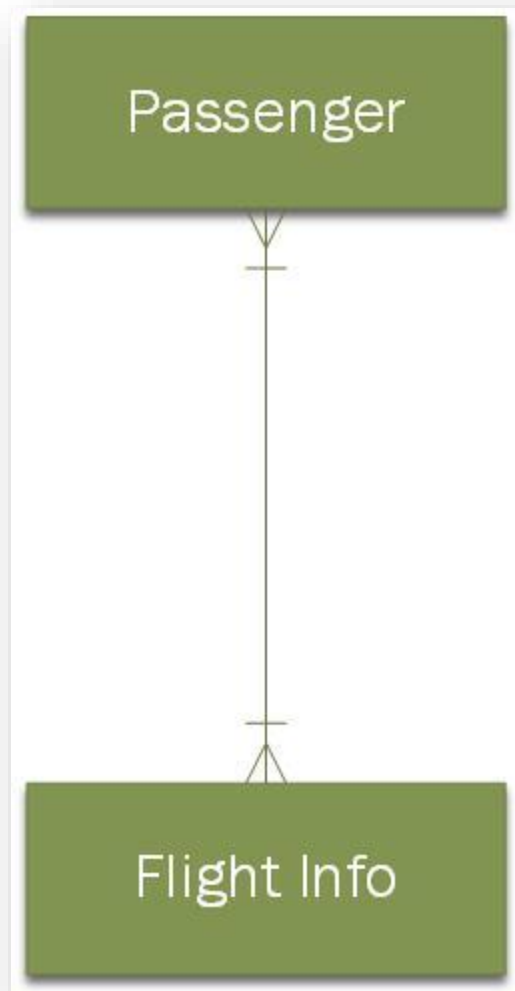


Figure 4 ER before Normalization

2.3 Normalization

2.3.1 Unnormalized

Passenger (Customer_ID, Customer_Name, Email, Maling_Address, Age, Contact_no, Gender, {Departure, Destination, Ticket_no, Ticket_Status, Flight_No, Fare, Customer Status, Date, Flight_duration, Aircraft_ID})

2.3.2 1NF

Passenger (Customer_ID, Customer_Name, Email, Age, Maling_Address, Contact_no, Gender, Ticket status, customer status, Fare, Ticket_no)

Flight Info (Customer_ID*, Departure, Destination, Flight_No, Flight_Date, Flight_duration, Aircraft_ID)

2.3.3 2NF

Customer_ID, Flight_No → Flight_Date, Aircraft_ID

Customer_ID →

Flight_No → Departure, Destination, Flight_Duration

Tables

Passenger_Flight (Customer_ID, Flight_No*, flight date, Aircraft_ID)

Flight Info (Flight_No, Departure, Destination, Flight_Duration)

2.3.4 3NF:

Passenger (Customer_ID, Customer_Name, Email, Age, Maling_Address, Contact_no, Gender, Customer Status, Ticket_no*)

Ticket_Details (Ticket_no, Ticket status, Aircraft_ID*, Fare)

Passenger_Flight (Customer Id*, Flight No*)

Aircraft_Info (Aircraft_ID, Flight_Date)

Flight Info (Flight_No, Departure, Destination, Flight_Duration)

2.4 ER Diagram after Normalisation

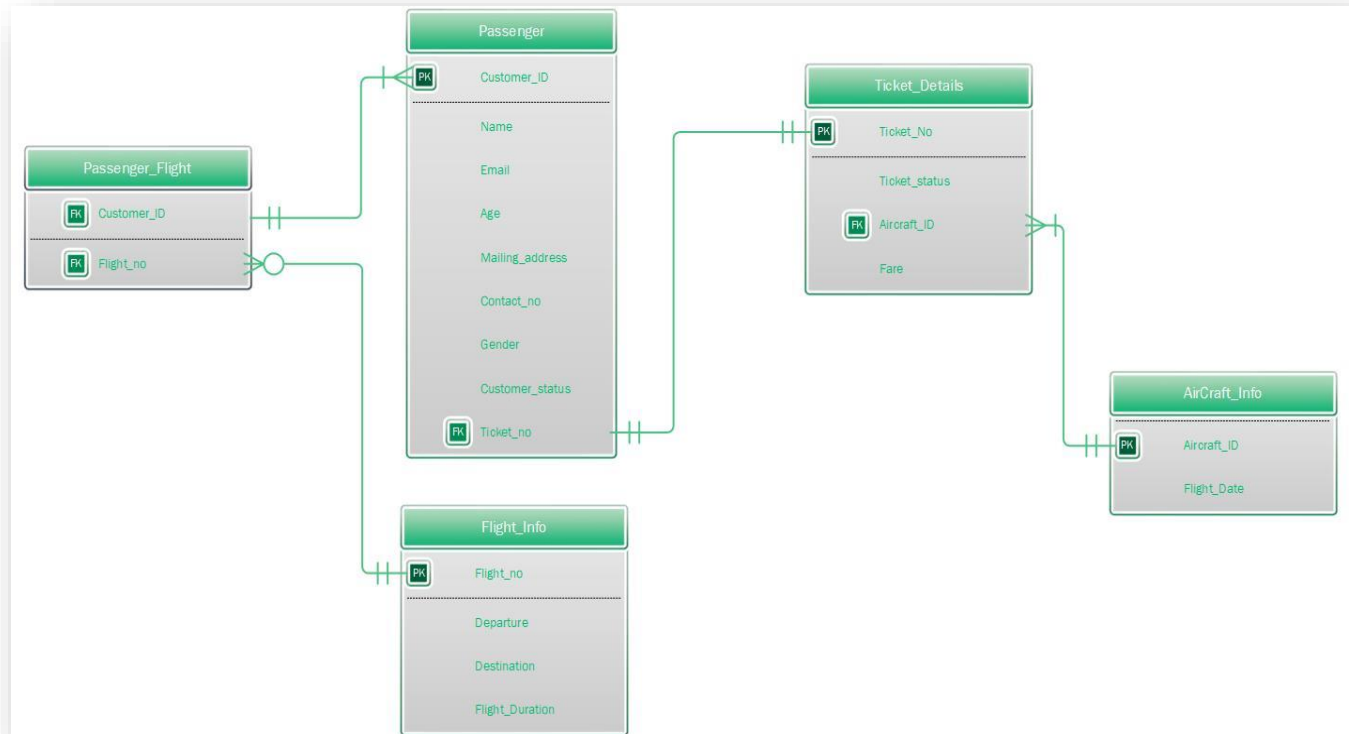


Figure 5 ER diagram after Normalization

3.Assumptions

This coursework was handed out for learning to design a database based on a domestic airline's passenger who travels through that particular airline. First of all, I made an Unnormalized table of a passenger with all the flight details and details of the passenger. All the assumptions made are as follows:

1. Every flight has multiple passengers and every passenger has multiple flights.
2. A flight must have a passenger and a passenger must be in a flight.
3. In the Unnormalized table it gives all the passenger details with the flight info, the primary key in this is Customer_ID and the foreign key is the Flight_No.
4. I assumed flight details as repeating group as flights are repeated in a single day and they travel to one or more destinations in a single day.
5. In 2NF Customer ID and Flight no gives the flight date and aircraft id details. And Customer _ID alone does not give anything but the flight_no gives all departure, destination and duration of the flight.

4.Database Implementation

4.1 Creating User:

```
SQL> conn system
Enter password:
Connected.
SQL> CREATE USER Shree_Airlines IDENTIFIED BY 12345;

User created.
```

Figure 6 Creation of User

4.2 Granting Unlimited tablespace:

```
SQL> GRANT UNLIMITED TABLESPACE TO Shree_Airlines;

Grant succeeded.
```

Figure 7 Grant and Permission 1

4.3 All the Grant and permission to the user:

```
SQL> GRANT CONNECT TO Shree_Airlines;

Grant succeeded.

SQL> GRANT create session, create table, create sequence, create view TO Shree_Airlines;

Grant succeeded.
```

Figure 8 Grant and Permission 2

4.4 Connecting to the User:

```
SQL> Conn Shree_Airlines;
Enter password:
Connected.
SQL> _
```

Figure 9 Connecting to User

4.5 Tables Generation:

4.5.1 Creating Aircraft Info Table:

```
SQL> CREATE TABLE Aircraft_Info(
2 Aircraft_ID NUMBER(10)
3 CONSTRAINT air_Aircraft_ID PRIMARY KEY,
4 Flight_Date DATE
5 CONSTRAINT air_Flight_Date_nn NOT NULL);

Table created.
```

Figure 10 Creation of Table 1

4.5.2 Creating Flight Info Table:

```
SQL> CREATE TABLE Flight_Info(
2 Flight_no NUMBER(10)
3 CONSTRAINT fli_Flight_no PRIMARY KEY,
4 Departure VARCHAR(50)
5 CONSTRAINT fli_Departure_nn NOT NULL,
6 Destination VARCHAR(50)
7 CONSTRAINT fli_Destination_nn NOT NULL,
8 Flight_Duration VARCHAR(10));

Table created.
```

Figure 11 Creation of Table 2

4.5.3 Creating Ticket Details Table:

```
SQL> CREATE TABLE Ticket_Details(  
 2 Ticket_no NUMBER(10)  
 3 CONSTRAINT tic_Ticket_no PRIMARY KEY,  
 4 Ticket_Status VARCHAR(20)  
 5 CONSTRAINT tic_Ticket_Status_nn NOT NULL,  
 6 Fare NUMBER(10),  
 7 Aircraft_ID NUMBER(10)  
 8 CONSTRAINT tic_Aircraft_ID_fk REFERENCES Aircraft_Info (Aircraft_ID));  
  
Table created.
```

Figure 12 Creation of Table 3

4.5.4 Creating Passenger Table:

```
SQL>  
SQL> CREATE TABLE Passenger(  
 2 Customer_ID NUMBER(10)  
 3 CONSTRAINT pas_Customer_ID PRIMARY KEY,  
 4 Customer_Name VARCHAR(50),  
 5 Email VARCHAR(60)  
 6 CONSTRAINT pas_Email_nn NOT NULL  
 7 CONSTRAINT pas_Email_uk UNIQUE,  
 8 Age VARCHAR(15)  
 9 CONSTRAINT pas_Age_nn NOT NULL,  
10 Mailing_Address VARCHAR(80)  
11 CONSTRAINT pas_Mailing_Address_nn NOT NULL,  
12 Contact_No NUMBER(15)  
13 CONSTRAINT pas_Contact_No_nn NOT NULL,  
14 GENDER VARCHAR(10)  
15 CONSTRAINT pas_GENDER_nn NOT NULL,  
16 Customer_Status VARCHAR(20)  
17 CONSTRAINT pas_Customer_Status_nn NOT NULL,  
18 Ticket_No NUMBER(5)  
19 CONSTRAINT tic_Ticket_No_fk REFERENCES Ticket_Details (Ticket_no));  
  
Table created.
```

Figure 13 Creation of Table 4

4.5.5 Creating Passenger Flight Table:

```
SQL> CREATE TABLE Passenger_Flight(
  2  Customer_ID NUMBER(10)
  3  CONSTRAINT pf_Customer_ID_fk REFERENCES Passenger (Customer_ID),
  4  Flight_no NUMBER(10)
  5  CONSTRAINT pf_Flight_no_fk REFERENCES Flight_Info (Flight_no));

Table created.
```

Figure 14 Creation of Table 5

4.6 Populate DB tables

4.6.1 Inserting Values in Aircraft Info Table:

```
SQL> INSERT ALL
  2  INTO AIRCRAFT_INFO(Aircraft_ID, Flight_Date) VALUES (9012, TO_DATE('DEC 20, 2017','MON DD, YYYY'))
  3  INTO AIRCRAFT_INFO(Aircraft_ID, Flight_Date) VALUES (9013, TO_DATE('DEC 25, 2017','MON DD, YYYY'))
  4  INTO AIRCRAFT_INFO(Aircraft_ID, Flight_Date) VALUES (9134, TO_DATE('NOV 10, 2017','MON DD, YYYY'))
  5  INTO AIRCRAFT_INFO(Aircraft_ID, Flight_Date) VALUES (8672, TO_DATE('JAN 1, 2018','MON DD, YYYY'))
  6  INTO AIRCRAFT_INFO(Aircraft_ID, Flight_Date) VALUES (9001, TO_DATE('JUN 16, 2016','MON DD, YYYY'))
  7  SELECT * FROM dual;

5 rows created.
```

Figure 15 Insertion in Table 1

4.6.2 Inserting Values in Flight Info Table:

```
SQL> INSERT ALL
  2  INTO FLIGHT_INFO(Flight_no, Departure, Destination, Flight_Duration) VALUES (4356,'Kathmandu','Bhadrapur','30 mins')
  3  INTO FLIGHT_INFO(Flight_no, Departure, Destination, Flight_Duration) VALUES (4327,'Kathmandu','Nepalgunj','40 mins')
  4  INTO FLIGHT_INFO(Flight_no, Departure, Destination, Flight_Duration) VALUES (4378,'Kathmandu','Dhangadi','50 mins')
  5  INTO FLIGHT_INFO(Flight_no, Departure, Destination, Flight_Duration) VALUES (4389,'Kathmandu','Biratnagar','25 mins')
  6  INTO FLIGHT_INFO(Flight_no, Departure, Destination, Flight_Duration) VALUES (4391,'Kathmandu','Bhairawa','20 mins')
  7  SELECT * FROM dual;

5 rows created.
```

Figure 16 Insertion in Table 2

4.6.3 Inserting Values in Ticket Details Table:

```
SQL> INSERT ALL
  2 INTO Ticket_Details(Ticket_no, Ticket_Status, Fare, Aircraft_ID) VALUES (105,'H Class',4000,9001)
  3 INTO Ticket_Details(Ticket_no, Ticket_Status, Fare, Aircraft_ID) VALUES (104,'B Class',5000,9012)
  4 INTO Ticket_Details(Ticket_no, Ticket_Status, Fare, Aircraft_ID) VALUES (101,'I Class',6000,9134)
  5 INTO Ticket_Details(Ticket_no, Ticket_Status, Fare, Aircraft_ID) VALUES (102,'S Class',4500,8672)
  6 INTO Ticket_Details(Ticket_no, Ticket_Status, Fare, Aircraft_ID) VALUES (103,'T Class',5500,9013)
  7 SELECT * FROM dual;

5 rows created.
```

Figure 17 Insertion in Table 3

4.6.4 Inserting Values in Passenger Table:

```
SQL> INSERT ALL
  2 INTO Passenger(Customer_ID, Customer_Name, Email, Age, Mailing_Address, Contact_No, GENDER, Customer_Status, Ticket_No) VALUES (560,'Radhika Seth','radhikaseth@yahoo.com',21,'Juhu Beach, Mumbai, India',9813567123,'Female','New',101)
  3 INTO Passenger(Customer_ID, Customer_Name, Email, Age, Mailing_Address, Contact_No, GENDER, Customer_Status, Ticket_No) VALUES (780,'Muna Gurung','gurungmuna@yahoo.com',21,'Kent,London,UK',9849456765,'Female','Old',102)
  4 INTO Passenger(Customer_ID, Customer_Name, Email, Age, Mailing_Address, Contact_No, GENDER, Customer_Status, Ticket_No) VALUES (340,'Nick Shrestha','shresthanick@outlook.com',24,'Bank Road,Pokhara,Nepal',9851098890,'Male','Old',103)
  5 INTO Passenger(Customer_ID, Customer_Name, Email, Age, Mailing_Address, Contact_No, GENDER, Customer_Status, Ticket_No) VALUES (125,'Rockin Khati','khatirockin@yahoo.com',22,'Bhanu Chowk,Janakpur,Nepal',9841678876,'Female','New',104)
  6 INTO Passenger(Customer_ID, Customer_Name, Email, Age, Mailing_Address, Contact_No, GENDER, Customer_Status, Ticket_No) VALUES (007,'Pratik Bikram Shah','bondpratikbond@gmail.com',24,'Sukedhara,Kathmandu,Nepal',9862104401,'Male','Employee',105)
  7 SELECT * FROM dual;

5 rows created.
```

Figure 18 Insertion in Table 4

4.6.5 Inserting Values in Passenger Flight Table:

```
SQL> INSERT ALL
  2 INTO Passenger_Flight(Customer_ID, Flight_no) VALUES (007,4391)
  3 INTO Passenger_Flight(Customer_ID, Flight_no) VALUES (560,4356)
  4 INTO Passenger_Flight(Customer_ID, Flight_no) VALUES (780,4327)
  5 INTO Passenger_Flight(Customer_ID, Flight_no) VALUES (340,4378)
  6 INTO Passenger_Flight(Customer_ID, Flight_no) VALUES (125,4389)
  7 SELECT * FROM dual;

5 rows created.
```

Figure 19 Insertion in Table 5

5.Database Querying

5.1 Information Queries:

5.1.1 Query 1:

List all passengers, old and current

```
SQL> SELECT Customer_Name, Customer_Status
2  FROM PASSENGER
3  WHERE Customer_Status = 'Old'
4  OR Customer_Status = 'Current';
```

CUSTOMER_NAME	CUSTOMER_STATUS
Radhika Shah	Current
Muna Gurung	Old
Nick Shrestha	Old
Rockin Khati	Current

Figure 20 Information: Query 1

5.1.2 Query 2:

List all passengers with all their addresses.

```
SQL> SELECT Customer_Name, Mailing_Address
2  FROM Passenger;
```

CUSTOMER_NAME	MAILING_ADDRESS
Radhika Shah	Juhu Beach,Mumbai,India
Muna Gurung	Juhu Kent,Ashford,UK
Nick Shrestha	Bank Road,Pokhara,Nepal
Rockin Khati	Bhanu Chowk,Janakpur,Nepal
Pratik Bikram Shah	Sukedhara,Kathmandu,Nepal

Figure 21 Information: Query 2

5.1.3 Query 3:

For a given airline, find all the flights conducted

```
SQL> SELECT Flight_no, Destination
2 FROM Flight_Info;
```

FLIGHT_NO	DESTINATION
4356	Bhadrapur
4327	Nepalgunj
4378	Dhangadi
4389	Biratnagar
4391	Bhairawa

```
SQL>
```

Figure 22 Information: Query 3

5.1.4 Query 4:

List all passengers that are also employees.

```
SQL> SELECT Customer_Name, Customer_Status
2 FROM Passenger
3 WHERE Customer_Status = 'Employee';
```

CUSTOMER_NAME	CUSTOMER_STATUS
Pratik Bikram Shah	Employee

Figure 23 Information: Query 4

5.2 Transaction Queries:

5.2.1 Query 1:

List the destinations covered by Shree Airlines:

```
SQL> SELECT Destination FROM Flight_Info;
```

```
DESTINATION
```

```
-----
```

```
Bhadrapur
```

```
Nepalgunj
```

```
Dhangadi
```

```
Biratnagar
```

```
Bhairawa
```

```
SQL> _
```

Figure 24 Transaction: Query 1

6.Critical Evaluation

This database shows the overall idea for the Shree Airlines which is a domestic airline tour operator in Nepal giving out the information of passenger and their flight details. As per the requirements all the attributes and entities were created and then all the relationship among them were assumed by myself. Normalization was done to chunk down the attributes into more table so that the data will be visible and accessible in a simpler form. In Unnormalized all the repeating group were made visible and separated from others. While taking it to First normal form all the repeating groups were broken down into another table. Removing of partial dependencies was done while taking it to second normal form and the at the third normal form all the transitive dependencies were removed. Doing normalization helped a lot to gain more knowledge about why normalization was done and facing the problems and dilemma was more of a learning opportunity for me to gain experience on performing normalization in near future. Creating tables with proper fields and keys on the SQL command line was more competitive than imagined as I faced a lot of simple and small errors that made me drop tables multiple of times and insert values and update rows.

This module Database has helped a lot to know about the importance of database management system in a company and has given me an opportunity to explore jobs in near future on database field. Learning this course also helped me in other modules like Software Engineering where I had to making ER diagrams and also list of proper entities and attributes with proper normalization. This module will surely be a step up to handle the database related jobs and duties in near future when I work for a firm. Not just the knowledge based on database is what I achieved from learning this module I gained a lot of ideas to tackle the problems and management of time and the design of a project when I will be handed out a project.

7. References

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