



TAYLOR'S UNIVERSITY

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BACHELOR DEGREE PROGRAMMES MARCH 2017 SEMESTER
FUNDAMENTALS OF DATABASE SYSTEMS
(ITS60604/SEC6514/SWE6514)

Assignment (Group Submission)

Weight: 25%

RELEASED DATE: 28 /3/2017

(Hand in Date: 12th June 2017)

DUE DATE: Via Times 12th June 2017 (9am)



Assignment Objectives:

- 1. Students will create the conceptual model for a case study that have been given in the assignment.**
- 2. Students will be able to create database and tables using the right data type that is most suitable to support the data insertion to take place.**
- 3. Students is required to carry out normalization process to validate the ER model that they have created.**
- 4. Students will be able to produce required reports from the database using SQL query language.**

Group Members

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Introduction

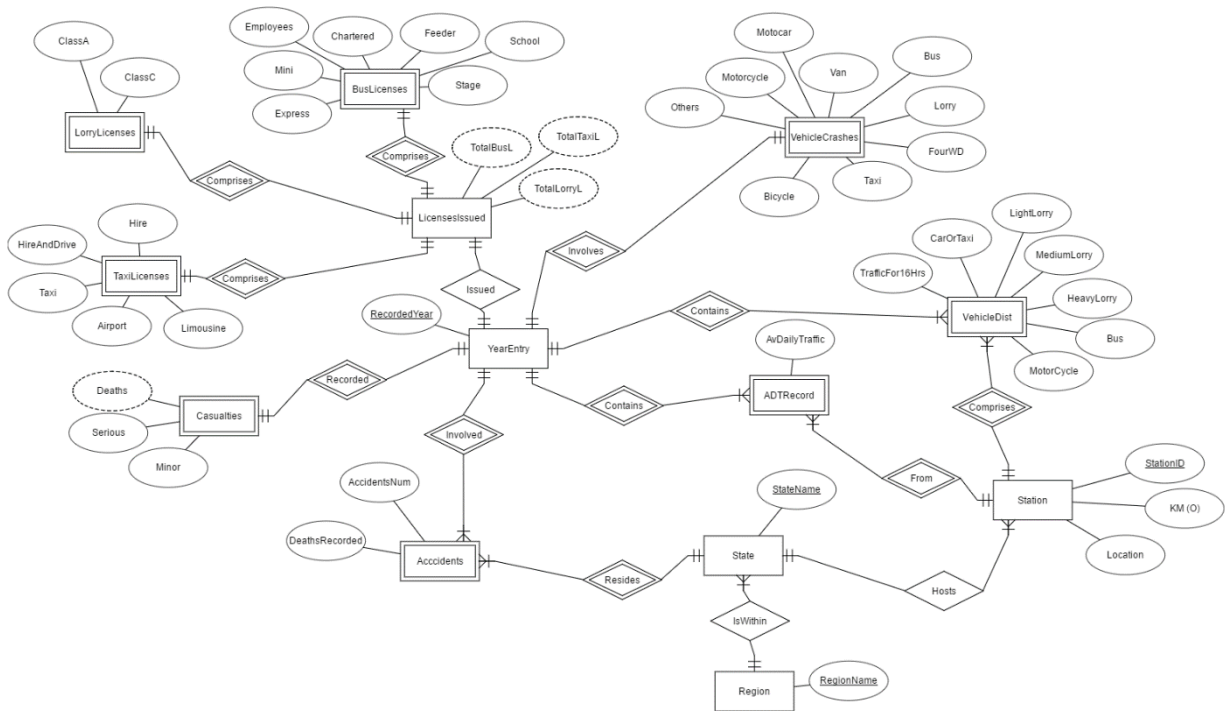
This documentation serves the purpose to outline the entire details about the database development. The documentation starts off by introduction, the deliverable and explanation and references at the end of this documentation. Throughout the documentation, the introduction serves the purpose to briefly explain the entire purpose and layout of the documentation. The deliverable and explanation illustrate the design of the database structure. The illustration takes forms in Entity relationship diagram, Reverse Engineering, logical model, physical model, data dictionary and data manipulation language. The references serve the purpose to outline the sources we had studied and to help reader to identify the original source if they wish.

Throughout the development of the database assignment, the team had learned a lot from the assignment and would like to take the opportunity to express the team's gratitude to the lecturer, Ms. Gayathri Mageswaran.

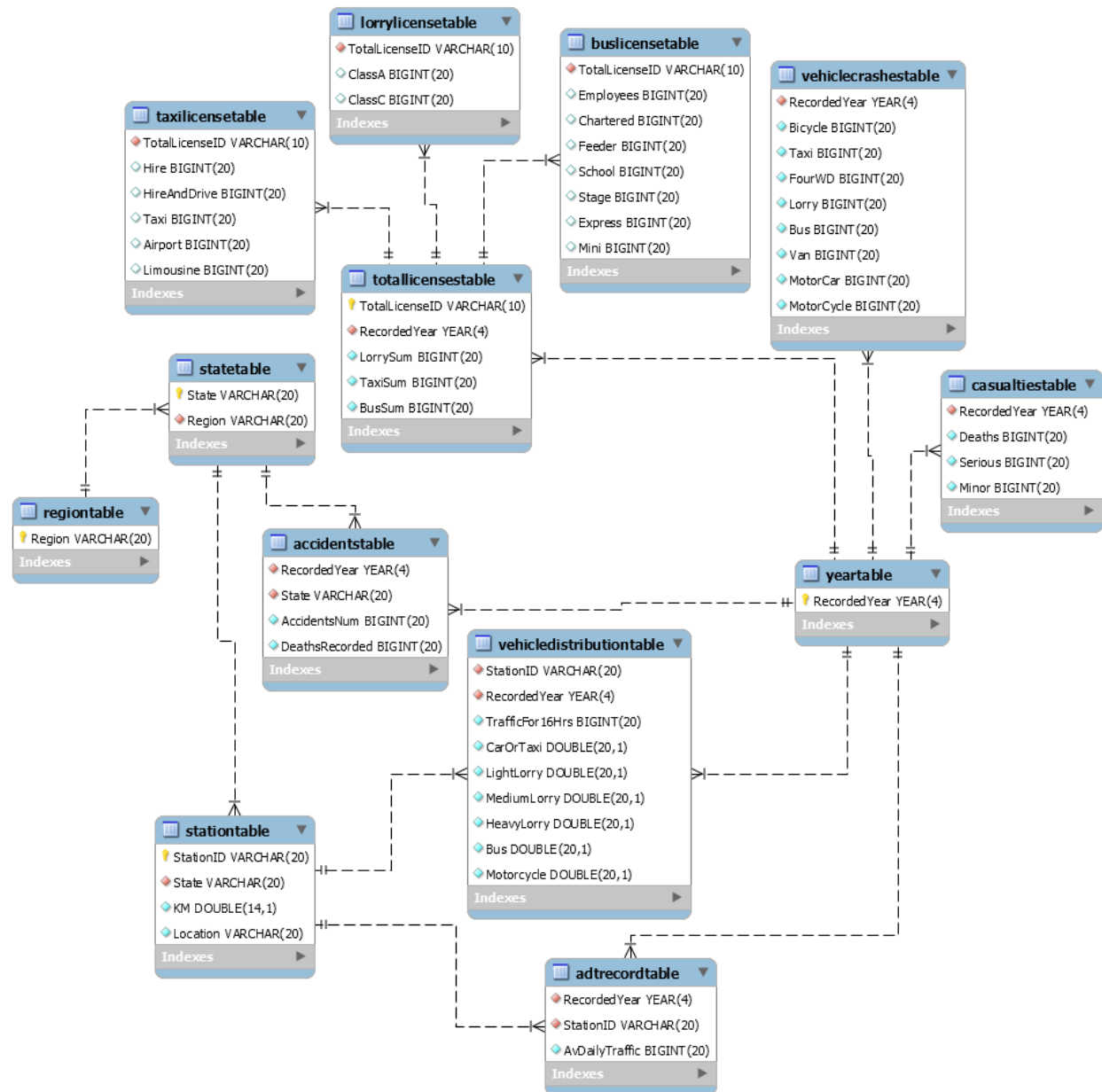
Task Allocation

	Task Allocation
Lim Cheng Qing	<ul style="list-style-type: none">• Data Definition Language (DDL)• Data Dictionary• Data Manipulation Language (DML)• Documentation
Kwan Juen Wen	<ul style="list-style-type: none">• Entity Relationship Diagram (ERD)• Logical and Physical Model

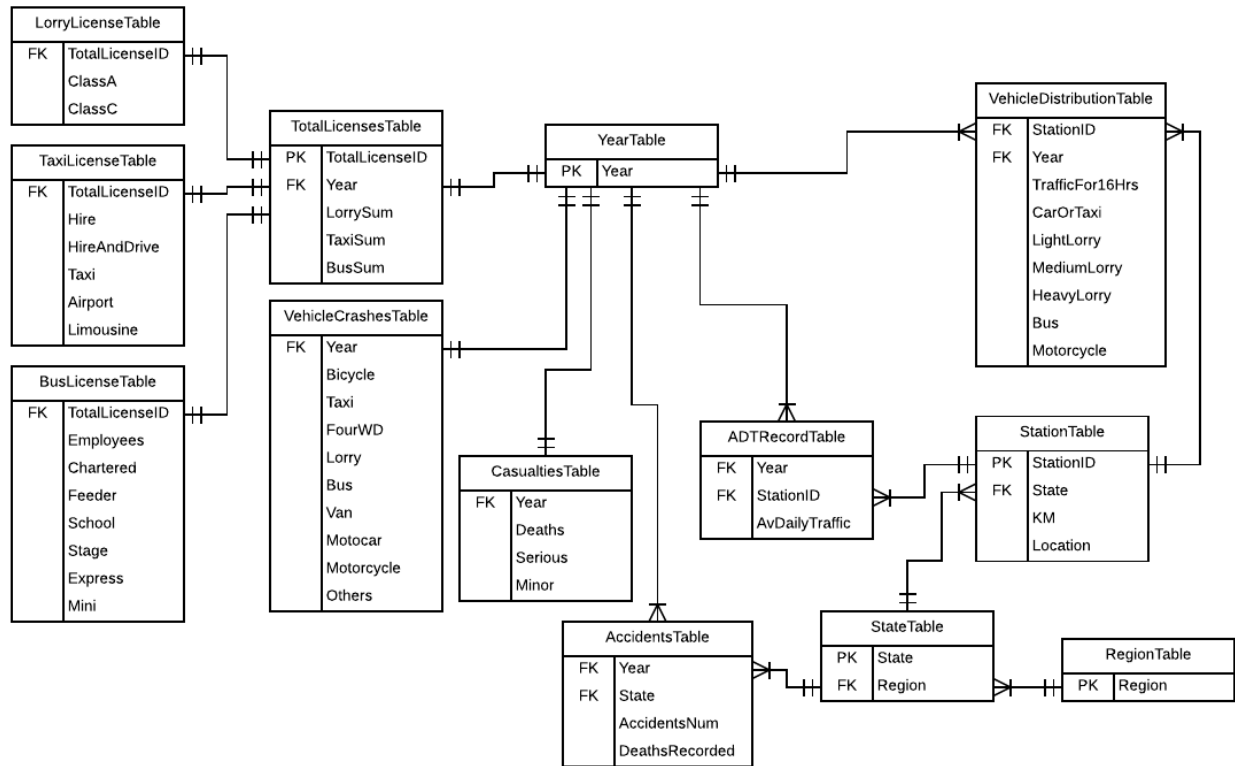
Entity Relationship Diagram



Reverse Engineering



Logical/Physical Model



Data Dictionary

Entity Name	Column Name	Data Type	Length	Primary Key	Foreign Key	Nullable	Unique
YearTable	AccidentYear	year	4	TRUE	FALSE	FALSE	TRUE
vehicledistributiontable	StationID	varchar	20	FALSE	TRUE	FALSE	FALSE
	AccidentYear	year	4	FALSE	TRUE	FALSE	FALSE
	TrafficFor16Hrs	bigint	20	FALSE	FALSE	FALSE	FALSE
	CarOrTaxi	double	20,1	FALSE	FALSE	FALSE	FALSE
	LightLorry	double	20,1	FALSE	FALSE	FALSE	FALSE
	MediumLorry	double	20,1	FALSE	FALSE	FALSE	FALSE
	HeavyLorry	double	20,1	FALSE	FALSE	FALSE	FALSE
	Bus	double	20,1	FALSE	FALSE	FALSE	FALSE
	Motorcycle	double	20,1	FALSE	FALSE	FALSE	FALSE
vehiclecrashestable	AccidentYear	year	4	FALSE	TRUE	FALSE	TRUE
	Bicycle	bigint	20	FALSE	FALSE	FALSE	FALSE
	Taxi	bigint	20	FALSE	FALSE	FALSE	FALSE
	FourWD	bigint	20	FALSE	FALSE	FALSE	FALSE
	Lorry	bigint	20	FALSE	FALSE	FALSE	FALSE
	Bus	bigint	20	FALSE	FALSE	FALSE	FALSE
	Van	bigint	20	FALSE	FALSE	FALSE	FALSE
	MotorCar	bigint	20	FALSE	FALSE	FALSE	FALSE
	MotorCycle	bigint	20	FALSE	FALSE	FALSE	FALSE
totallicensetable	TotalLicenseID	varchar	10	TRUE	FALSE	FALSE	TRUE
	AccidentYear	year	4	FALSE	TRUE	FALSE	TRUE
	LorrySum	bigint	20	FALSE	FALSE	FALSE	FALSE
	TaxiSum	bigint	20	FALSE	FALSE	FALSE	FALSE
	BusSum	bigint	20	FALSE	FALSE	FALSE	FALSE
taxilicensetable	TotalLicenseID	varchar	10	FALSE	TRUE	FALSE	TRUE
	Hire	bigint	20	FALSE	FALSE	TRUE	FALSE
	HireAndDrive	bigint	20	FALSE	FALSE	TRUE	FALSE
	Taxi	bigint	20	FALSE	FALSE	TRUE	FALSE
	Airport	bigint	20	FALSE	FALSE	TRUE	FALSE
	Limousine	bigint	20	FALSE	FALSE	TRUE	FALSE
stationtable	StationID	varchar	20	TRUE	FALSE	FALSE	TRUE
	State	varchar	20	FALSE	TRUE	FALSE	TRUE
	KM	double	14,1	FALSE	FALSE	FALSE	FALSE
	Location	varchar	20	FALSE	FALSE	FALSE	FALSE
statetable	State	varchar	20	TRUE	FALSE	FALSE	TRUE
	Region	varchar	20	FALSE	TRUE	FALSE	FALSE
regiontable	Region	varchar	20	TRUE	FALSE	FALSE	TRUE
lorrylicensetable	TotalLicenseID	varchar	10	FALSE	TRUE	FALSE	TRUE
	ClassA	bigint	20	FALSE	FALSE	TRUE	FALSE
	ClassC	bigint	20	FALSE	FALSE	TRUE	FALSE
casualtiestable	AccidentYear	year	4	FALSE	TRUE	FALSE	TRUE
	Deaths	bigint	20	FALSE	FALSE	FALSE	FALSE
	Serious	bigint	20	FALSE	FALSE	FALSE	FALSE
	Minor	bigint	20	FALSE	FALSE	FALSE	FALSE
buslicensetable	TotalLicenseID	varchar	10	TRUE	FALSE	FALSE	TRUE
	Employees	bigint	20	FALSE	FALSE	TRUE	FALSE
	Chartered	bigint	20	FALSE	FALSE	TRUE	FALSE
	Feeder	bigint	20	FALSE	FALSE	TRUE	FALSE
	School	bigint	20	FALSE	FALSE	TRUE	FALSE
	Stage	bigint	20	FALSE	FALSE	TRUE	FALSE
	Express	bigint	20	FALSE	FALSE	TRUE	FALSE
	Mini	bigint	20	FALSE	FALSE	TRUE	FALSE
adtreordtables	AccidentYear	year	4	FALSE	TRUE	FALSE	TRUE
	StationID	varchar	20	FALSE	TRUE	FALSE	FALSE
	AvDailyTraffic	varchar	20	FALSE	FALSE	FALSE	FALSE
accidentstable	AccidentYear	year	4	FALSE	TRUE	FALSE	FALSE
	State	varchar	20	FALSE	TRUE	FALSE	FALSE
	AccidentsNum	bigint	20	FALSE	FALSE	FALSE	FALSE
	DeathsRecorded	bigint	20	FALSE	FALSE	FALSE	FALSE

Data Manipulation Language

- 1) Total Road Accidents by States, 2006 – 2015

```
SELECT statetable.State, SUM(accidentstable.AccidentsNum) AS TotalRoadAccident
FROM yeartable
JOIN accidentstable
ON yeartable.RecordedYear = accidentstable.RecordedYear
JOIN statetable
ON statetable.state = accidentstable.state
WHERE yeartable.RecordedYear BETWEEN 2006 AND 2015
GROUP BY accidentstable.state;
```

State	TotalRoadAccident
Johor	564126
Kedah	185901
Kelantan	93156
Melaka	141359
Negeri Sembilan	199470
Pahang	175627
Perak	327068
Perlis	26438
Pulau Penang	361530
Sabah	160951
Sarawak	171465
Selangor	1186935
Terengganu	96596
W.P. KUALA LUMPUR	563207

- 2) Total Motor Vehicles Involved in Road Accidents by Type of Vehicles, 2006 – 2015

```
SELECT
SUM(v.Bicycle) AS Bicycle,
SUM(v.Taxi) AS Taxi,
SUM(v.FourWD) AS FourWD,
SUM(v.Lorry) AS Lorry,
SUM(v.Bus) AS Bus,
SUM(v.Van) AS Van,
SUM(v.MotorCar) AS MotorCar,
SUM(v.MotorCycle) AS MotorCycle
FROM vehiclecrashestable v
JOIN yeartable y
ON v.RecordedYear = y.RecordedYear
WHERE v.RecordedYear BETWEEN 2006 AND 2015;
```

Bicycle	Taxi	FourWD	Lorry	Bus	Van	MotorCar	MotorCycle
1191726	5336671	179750	97024	444810	318717	98872	19758

3) Number of Licenses Issued by Class of Licenses, 2006 – 2015

```

SELECT *
FROM
(SELECT
    y.recordedYear,
    blt.Employees,
    blt.Chartered,
    blt.Feeder,
    blt.School,
    blt.Stage,
    blt.Express,
    blt.Mini,
    tlst.BusSum,
    llt.ClassA,
    llt.ClassC,
    tlst.LorrySum,
    tlt.Hire,
    tlt.HireAndDrive,
    tlt.Taxi,
    tlt.Airport,
    tlt.Limousine,
    tlst.TaxiSum
FROM
    yeartable y
JOIN totallicensetable tlst ON tlst.RecordedYear = y.RecordedYear
JOIN buslicensetable blt ON blt.TotalLicenseID = tlst.TotalLicenseID
JOIN lorrylicensetable llt ON llt.TotalLicenseID = tlst.TotalLicenseID
JOIN taxilicensetable tlt ON tlt.TotalLicenseID = tlst.TotalLicenseID) AS
unpivotedTable;

```

	recordedYear	Employees	Chartered	Feeder	School	Stage	Express	Mini	BusSum	ClassA	ClassC	LorrySum	Hire	HireAndDrive	Taxi	Airport	Limousine	TaxiSum
	2006	361	60	NULL	128	14	5	299	867	3875	554	4429	43	1709	237	360	25	2374
	2007	540	356	11	361	NULL	19	299	2133	12492	1746	14238	257	1155	689	228	292	18992
	2008	513	389	12	675	58	378	1423	3448	14913	2061	16974	255	1388	624	498	131	23318
	2009	385	328	121	255	127	181	1129	2526	16152	2464	18616	1221	3139	2945	198	97	28742
	2010	259	332	18	429	66	232	1074	2410	16118	2614	18732	1075	1680	4993	136	60	7944
	2011	636	142	211	12	591	12	927	2531	14664	2250	16914	127	1545	945	68	4965	7560
	2012	93	161	39	431	2	66	853	1645	12992	2357	15349	228	2635	2486	9	148	5506
	2013	330	181	24	603	7	28	924	2097	13599	2987	16586	76	603	1233	10	48	1970
	2014	250	176	14	515	6	9	959	1642	13914	2967	16881	36	333	1209	5	59	1929
	2015	487	140	19	506	6	12	881	994	12584	2912	15496	38	194	605	29	78	2051

4) Total Number of Accidents by Year

```
SELECT y.RecordedYear, SUM(a.AccidentsNum) AS TotalAccidents
FROM accidentstable a
JOIN yeartable y
ON a.RecordedYear = y.RecordedYear
GROUP BY a.RecordedYear;
```

	RecordedYear	TotalAccidents
	2006	341190
	2007	363319
	2008	373071
	2009	397330
	2010	414421
	2011	459040
	2012	462423
	2013	477204
	2014	476196
	2015	489635

5) Number of Stations by States

```
SELECT statetable.State, count(stationtable.StationID) AS TotalStation
FROM stationtable
JOIN statetable
ON statetable.State = stationtable.State
GROUP BY statetable.State;
```

	State	TotalStation
	Johor	1
	Kedah	1
	Kelantan	1
	Melaka	1
	Negeri Sembilan	1
	Pahang	1
	Perak	1
	Perlis	1
	Pulau Penang	1
	Sabah	1
	Sarawak	1
	Selangor	1
	Terengganu	1
	W.P. KUALA LUMPUR	1

References

Ministry of Transport Malaysia, 2015. *Transport Statistic Malaysia 2015*, s.l.: Ministry of Transport Malaysia.