Report

FIT3003 – Business Intelligence and Data Warehousing

MONASH University

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GROUP ASSIGNMENT COVER SHEET

Student ID Number	Surname	Given Names
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* Please include the names of all other group members.

Unit name and code	FIT3003 Business Intelligence and Data Warehousing	
Title of assignment	Major Assignment: BI & DW	
Lecturer/tutor	David Taniar / Yiwei Zhong	
Tutorial day and time	Thursday / 14.00 (Lab05)	**Campus**
Is this an authorised group assignment?	**Yes** **No**	
Has any part of this assignment been previously submitted as part of another unit/course? **Yes** **No**		
Due Date 11 October		**Date submitted** 09/10/2023

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Updated: 17 Jun 2014

Contribution Declaration Form
(to be completed by all team members)

Please fill in the form with the contribution from each student towards the assignment.

1 NAME AND CONTRIBUTION DETAILS

Student ID	Student Name	Contribution Percentage
32805942	Agung Ratana Jayo Silim	50%
32518625	Mohammad Nadzmi Ag Thomas	50%

2 DECLARATION

We declare that:

- The information we have supplied in or with this form is complete and correct.
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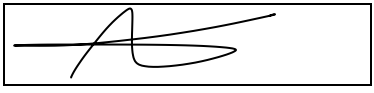


Signatures

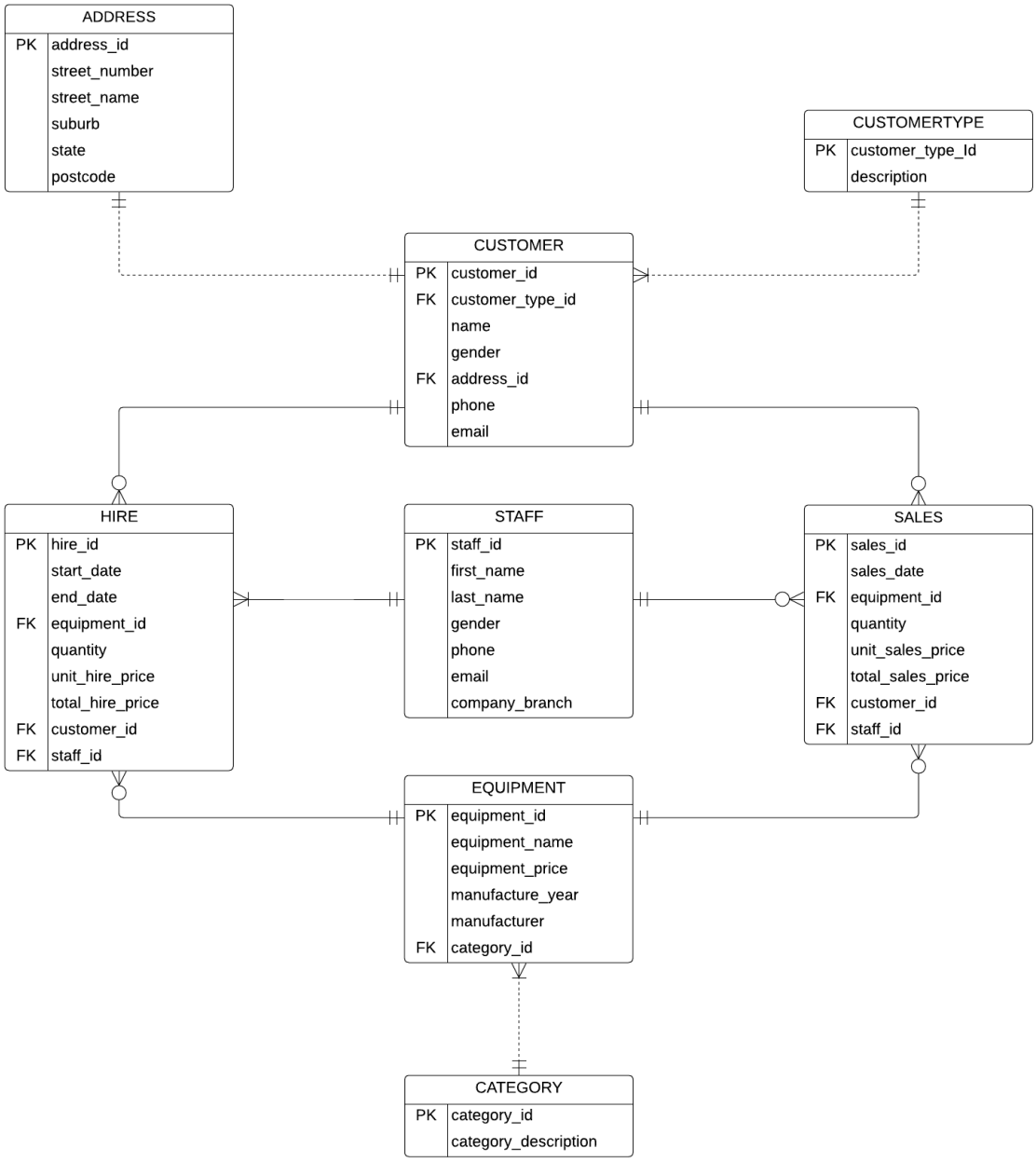
09 /

Day Month Year

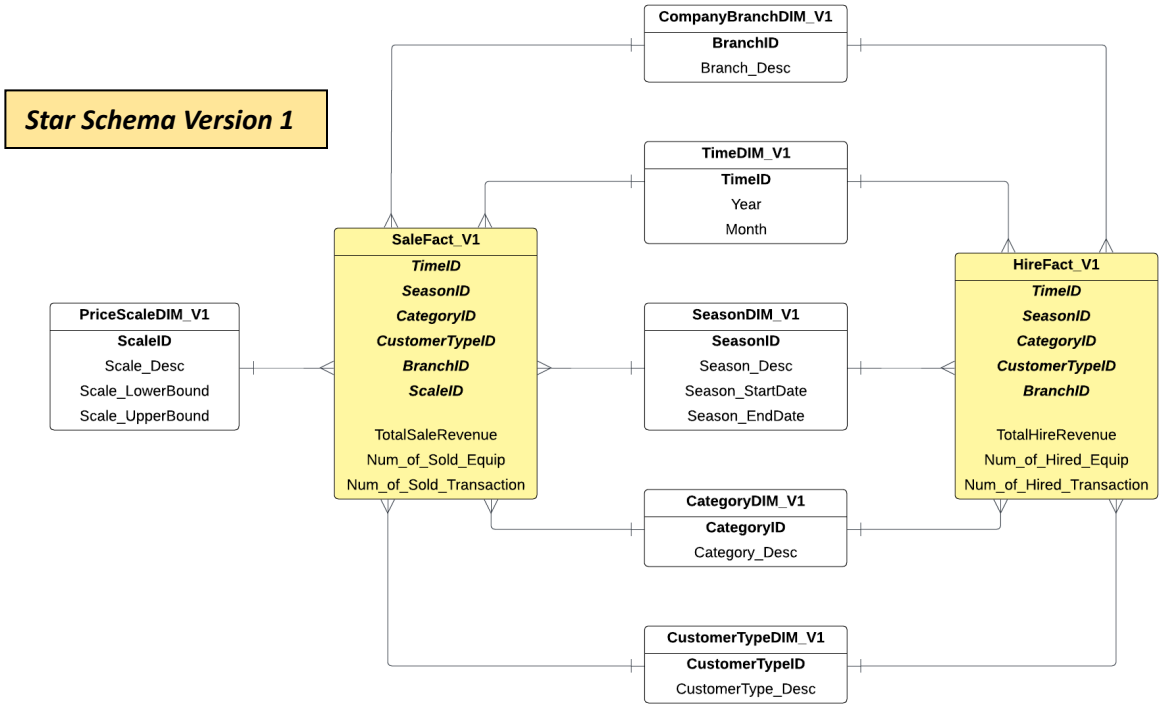
Date 10 / 2023

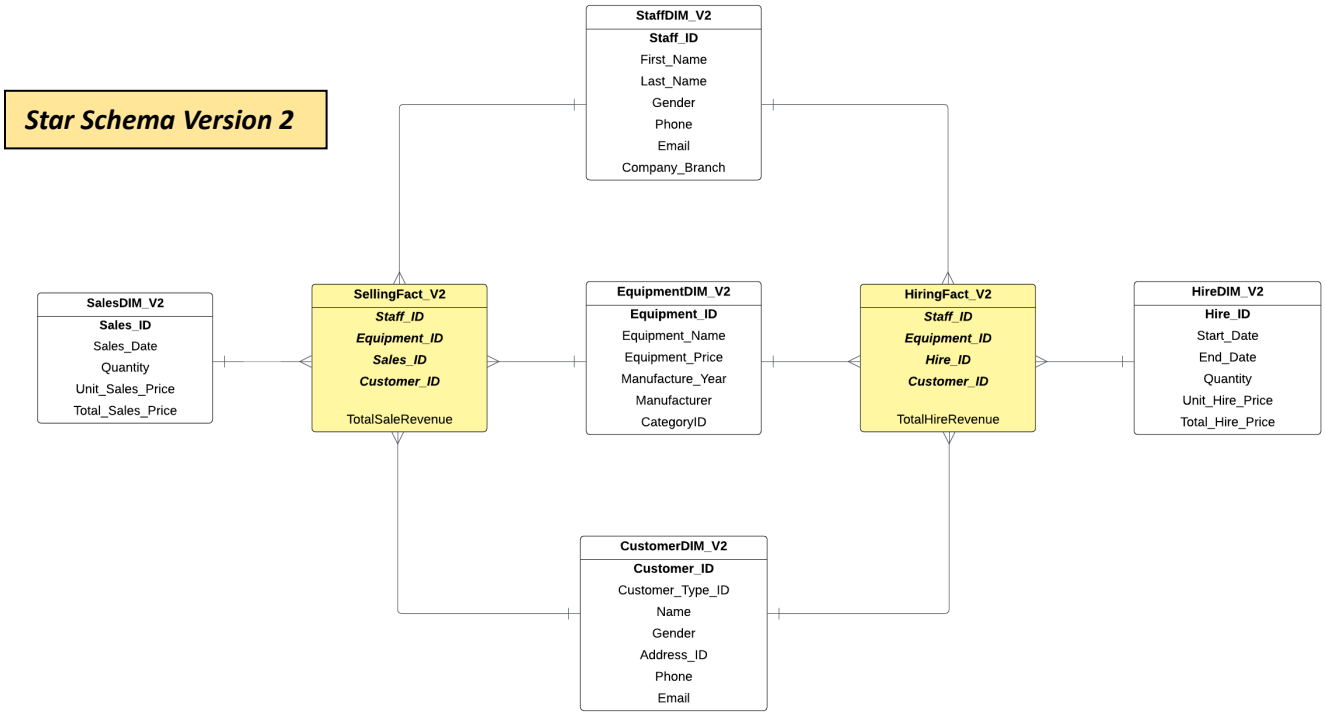
Task C.1

a) E/R diagram of the operational database



b) Star schemas version 1 and 2





c)

An explanation of the difference among SCD types 1, 2, 3, 4, and 6 and Reason for not using SCD

In the context of sales and hire of equipment, Slowly Changing Dimensions (SCD) play a crucial role in data warehousing to maintain accurate historical records. SCD Type 1, focusing on the latest values, suits scenarios where the sales and hire records don't require historical context, ensuring simplicity and efficiency in storage.

On the other hand, SCD Type 2 captures historical changes, relevant in situations where it's important to differentiate between different versions of equipment over time. This method appends new records to the main dimension, providing a clear timeline of changes without complicating the schema.

SCD Type 3 simplifies this approach by storing only limited historical data, like the current and previous prices. This method streamlines the database, providing a balance between historical context and simplicity.

SCD Type 4 introduces a new dimension to store changes, eliminating the need for unique identifiers for the same sale or hire. This method ensures accuracy by preserving the entire history of attribute value changes, guaranteeing precise reporting.

Lastly, SCD Type 6 combines the advantages of both Type 2 and Type 3. It maintains historical accuracy without the need for separate identifiers, keeping the entire history within the original dimension table. This method is especially useful in scenarios where a detailed history is necessary for both sales and hire records without complicating the database structure.

Based on the major assignment description, MonEquip does not need the history of the price for hire and sales, but MonEquip wants to keep track of its business, such as calculating revenue, number of equipment sold or hired, etc. In brief, SCD dimensions are not needed since there is no requirement from the company itself. Star schema versions 1 and 2 prioritise simplicity and efficiency in querying current data, without the complexity introduced by SCDs for historical tracking.

d)

Difference between Star Schema Version 1 and 2

The main difference between Star Schema Version 1 and 2 lies in their level of aggregation, Star Schema Version 1 has the highest level of aggregation, while Star Schema Version 2 has the lowest level of aggregation (Level-0). The level of aggregation is inversely related to the granularity of the Star Schema, where the higher the level of aggregation the lower the granularity of the data provided.

In Star Schema Version 1 (highest level of aggregation), the data model provided is in the lowest form of granularity. In other words, it is the most summarised or aggregated view of the data we can construct using the data available in the database. For example, we are only concerned with crucial information such as Total Revenue, Number of Hired/Sold Equipment, Number of Transaction, Season, Year, Month, Customer Type, CategoryID, and Price Scale which all can be further broken down into more granular levels.

In contrast, in Star Schema Version 2 (lowest level of aggregation), the data model provided has the lowest level of aggregation available in the source system. In other words, it is the most detailed view of the data we can construct using the data available in the database. For example, instead of using Month, Year, and Season, we will use the actual date to store the time (Sales_Date for Sales data, Start_Date, and End_Date for Hire data). The date can't be further broken down as the information regarding Hours, Minutes, etc isn't available in the database. Moreover, we also include three new entities, Equipment which is broken down from Category Dimension, Customer which is broken down from Customer Type DImension, and Staff which is broken down from Branch Dimension.

Task C.2 (DATA CLEANING STAGE)

a)

```
--Problem 1

--There are duplicated values in the customer table.

SELECT
   customer_id,
   COUNT(*)
FROM
   customer
GROUP BY
   customer_id
HAVING
   COUNT(*) > 1;


--Solution Problem 1

CREATE TABLE customer_clean
   AS
      SELECT DISTINCT
         *
      FROM
         customer
      ORDER BY
         customer_id;


--Problem 2

--There is a relationship problem between HIRE table and EQUIPMENT, STAFF, CUSTOMER tables where there is some equipment_id, staff_id, and customer_id in Hire table which not listed in those tables

-- Relationship error between Hire-Equipment
```

```
SELECT
   *
FROM
   hire
WHERE
   equipment_id NOT IN (
      SELECT
         equipment_id
      FROM
         equipment
   );

-- Relationship error between Hire-Customer
SELECT
   *
FROM
   hire
WHERE
   customer_id NOT IN (
      SELECT
         customer_id
      FROM
         customer
   );

-- Relationship error between Hire-Staff
SELECT
   *
```

```
FROM
   hire
WHERE
   staff_id NOT IN (
      SELECT
         staff_id
      FROM
         staff
   );

--Solution Problem 2
DELETE
FROM
   hire
WHERE
   equipment_id NOT IN (
      SELECT
         equipment_id
      FROM
         equipment
   );

DELETE
FROM
   hire
WHERE
   customer_id NOT IN (
      SELECT
```

```
        customer_id
    FROM
        customer
);

DELETE
FROM
    hire
WHERE
    staff_id NOT IN (
        SELECT
            staff_id
        FROM
            staff
    );

--Problem 3
--There are inconsistent values where the end date is not after the start date in HIRE table
SELECT
    *
FROM
    hire
WHERE
    end_date < start_date;

--Solution Problem 3
DELETE
FROM
```

```
   hire
WHERE
   end_date < start_date;

--Problem 4
--The end_date for year component is greater than December 2020 in HIRE table
SELECT
   *
FROM
   hire
WHERE
   to_char(end_date, 'YYYY') > 2020;

--Solution Problem 4
DELETE
FROM
   hire
WHERE
   to_char(end_date, 'YYYY') > 2020;

--Problem 5
--There is a null value in CATEGORY table
SELECT
   *
FROM
   category
WHERE
   category_description = 'null';
```

```
--Solution Problem 5
DELETE
FROM
   category
WHERE
   category_description = 'null';

--Problem 6
--There is negative value in quantity attribute in SALES table
SELECT
   *
FROM
   sales
WHERE
   quantity < 0;

--Solution Problem 6
DELETE
FROM
   sales
WHERE
   quantity < 0;

--Problem 7
--There is wrong calculation on total_hire_price in HIRE table
SELECT
   *
FROM
```

```
   hire
WHERE
      start_date != end_date
   AND total_hire_price != ( end_date - start_date ) * quantity * unit_hire_price;
```

--Solution Problem 7

```
UPDATE hire
SET
   total_hire_price = ( end_date - start_date ) * quantity * unit_hire_price
WHERE
      start_date != end_date
   AND total_hire_price != ( end_date - start_date ) * quantity * unit_hire_price;
```

--Problem 8

--There are negative values in total_hire price in HIRE table

```
SELECT
   *
FROM
   hire
WHERE
   total_hire_price < 0;
```

--Solution Problem 8

```
DELETE
FROM
   hire
WHERE
   total_hire_price < 0;
```

--Problem 9

--Relationship problem between equipment table and category table

```
SELECT
   *
FROM
   equipment
WHERE
   category_id NOT IN (
      SELECT
         category_id
      FROM
         category
   );
```

--Solution Problem 9

```
DELETE
FROM
   equipment
WHERE
   category_id NOT IN (
      SELECT
         category_id
      FROM
         category
   );
```

d)

Before Data Cleaning

- **PROBLEM 1 (Duplicated values in Customer Table)**

	CUSTOMER_ID	CUSTOMER_TYPE_ID	NAME	GENDER	ADDRESS_ID	PHONE	EMAIL
1	52	2	Abbie Maddie	Male	52	904 627 9038	amaddielf@columbia.edu
2	52	2	Abbie Maddie	Male	52	904 627 9038	amaddielf@columbia.edu
3	52	2	Abbie Maddie	Male	52	904 627 9038	amaddielf@columbia.edu
4	52	2	Abbie Maddie	Male	52	904 627 9038	amaddielf@columbia.edu

- **PROBLEM 2 (relationship problem between HIRE table and EQUIPMENT, STAFF, CUSTOMER tables where there are some equipment_id, staff_id, and customer_id in Hire table)**

	HIRE_ID	START_DATE	END_DATE	EQUIPMENT_ID	QUANTITY	UNIT_HIRE_PRICE	TOTAL_HIRE_PRICE	CUSTOMER_ID	STAFF_ID
1	301	08-DEC-20	08-DEC-20	190	1	300	300	181	174
2	303	25-JAN-90	27-DEC-99	43	3	50	-150	53	223
3	302	05-DEC-20	17-OCT-20	21	2	100	200	111	123
4	304	08-DEC-20	08-DEC-20	114	1	350	-1	34	85

- **PROBLEM 3 (inconsistent values where the end date is not after the start date in HIRE table)**

	HIRE_ID	START_DATE	END_DATE	EQUIPMENT_ID	QUANTITY	UNIT_HIRE_PRICE	TOTAL_HIRE_PRICE	CUSTOMER_ID	STAFF_ID
1	302	05-DEC-20	17-OCT-20	21	2	100	200	111	123

- **PROBLEM 4 (The end_date for year component is greater than December 2020 in HIRE table)**

	HIRE_ID	START_DATE	END_DATE	EQUIPMENT_ID	QUANTITY	UNIT_HIRE_PRICE	TOTAL_HIRE_PRICE	CUSTOMER_ID	STAFF_ID
1	303	25-JAN-90	27-DEC-99	43	3	50	-150	53	223

- **PROBLEM 5 (null value in CATEGORY table)**

	CATEGORY_ID	CATEGORY_DESCRIPTION
1	15	null

- **PROBLEM 6 (negative value in quantity attribute in SALES table)**

	SALES_ID	SALES_DATE	EQUIPMENT_ID	QUANTITY	UNIT_SALES_PRICE	TOTAL_SALES_PRICE	CUSTOMER_ID	STAFF_ID
1	151	15-DEC-20	20	-3	45500	182000	2	37

- **PROBLEM 7 (wrong calculation on total_hire_price in HIRE table)**

	HIRE_ID	START_DATE	END_DATE	EQUIPMENT_ID	QUANTITY	UNIT_HIRE_PRICE	TOTAL_HIRE_PRICE	CUSTOMER_ID	STAFF_ID
1	1	11-MAY-18	14-MAY-18	135	3	80	240	77	2
2	2	17-MAY-18	20-MAY-18	49	2	660	1320	70	38
3	4	21-MAY-18	25-MAY-18	36	1	540	540	124	41
4	5	21-MAY-18	23-MAY-18	37	2	600	1200	87	35
5	6	22-MAY-18	26-MAY-18	53	2	500	1000	15	31
6	7	24-MAY-18	28-MAY-18	73	3	140	420	77	10
7	8	25-MAY-18	28-MAY-18	135	3	80	240	140	40
8	11	12-JUN-18	14-JUN-18	71	2	450	900	145	21
9	18	12-JUL-18	14-JUL-18	25	3	600	1800	114	3
10	24	27-JUL-18	29-JUL-18	99	2	20	40	63	5
11	25	27-JUL-18	29-JUL-18	147	1	220	220	19	2
12	26	30-JUL-18	03-AUG-18	22	3	450	1350	113	27
13	27	01-AUG-18	03-AUG-18	10	2	360	720	99	47

- **PROBLEM 8 (negative values in total_hire price in HIRE table)**

	HIRE_ID	START_DATE	END_DATE	EQUIPMENT_ID	QUANTITY	UNIT_HIRE_PRICE	TOTAL_HIRE_PRICE	CUSTOMER_ID	STAFF_ID
1	303	25-JAN-90	27-DEC-99	43	3	50	-150	53	223
2	304	08-DEC-20	08-DEC-20	114	1	350	-1	34	85

- **PROBLEM 9 (Relationship problem between equipment table and category table)**

	EQUIPMENT_ID	EQUIPMENT_NAME	EQUIPMENT_PRICE	MANUFACTURE_YEAR	MANUFACTURER	CATEGORY_ID
1	158	EXCAVATOR - POST HOLE ATTACHMENT SUIT 3.5T	12200	2017	HITACHI	15

After Data Cleaning

-- Category Table

	CATEGORY_ID	CATEGORY_DESCRIPTION
1	1	Access
2	2	Air Compressor
3	3	Compaction
4	4	Concrete
5	5	Earthmoving
6	6	Generators
7	7	Landscaping
8	8	Lighting
9	9	Plumbing
10	10	Rail
11	11	Safety
12	12	Site Equipment
13	13	Trailers
14	14	Vehicles

-- Customer Table

	CUSTOMER_ID	CUSTOMER_TYPE_ID	NAME	GENDER	ADDRESS_ID	PHONE	EMAIL
36	36	2	Edward Nesterov	Male	36	294 947 1931	enesterovz@usatoday.com
37	37	1	Brucie Ducarne	Male	37	795 851 6198	bducarne10@cdc.gov
38	38	2	Augustin Lofting	Male	38	310 903 3754	aloftingl1@shinystat.com
39	39	1	Sloane Tofpik	Male	39	391 519 8536	stofpikl2@ebay.co.uk
40	40	1	Iggy Olorenshaw	Male	40	398 697 7185	iolorenshawl3@behance.net
41	41	1	Clareta Tibbotts	Female	41	297 212 4911	ctibbottsl4@phoca.cz
42	42	1	Audy Dabes	Female	42	144 953 2638	adabesl5@blinklist.com
43	43	1	Blakeley De Gregorio	Female	43	581 203 0392	bdel6@github.com
44	44	1	Lynn Mandal	Female	44	159 685 4255	lmandall7@prweb.com
45	45	1	Shae Bowbrick	Female	45	713 248 0235	sbowbrickl8@fema.gov
46	46	2	Koressa Avery	Female	46	302 523 4116	kaveryl9@sbwire.com
47	47	2	Selle Berriman	Female	47	796 382 3259	sberrimanla@google.nl
48	48	2	Marmaduke Ganter	Male	48	381 255 1620	mganterlb@about.com
49	49	1	Claudie Gleasane	Female	49	962 239 6598	cgleasanelc@cdc.gov
50	50	2	Allys Portal	Female	50	426 559 2409	aportalld@shareasale.com
51	51	1	Maye Cathenod	Female	51	326 485 2175	mcathenodle@istockphoto.com
52	52	2	Abbie Maddie	Male	52	904 627 9038	amaddielf@columbia.edu
53	53	2	Jenny Joincey	Female	53	546 907 3535	jjoinceylg@people.com.cn
54	54	1	Nichols Norvell	Male	54	890 907 0718	nnorvelllh@cafepress.com
55	55	1	Brook Wrixon	Female	55	625 901 9661	bwrixonli@hhs.gov
56	56	2	Tome Sweeny	Male	56	359 981 0425	tsweenylj@1688.com
57	57	2	Ailina Giddings	Female	57	119 681 8901	agiddingslk@arstechnica.com
58	58	2	Ethelda Stook	Female	58	135 884 9896	estookll@amazon.co.uk
59	59	2	Deni Rraundl	Female	59	135 394 0610	drraundllm@amazonaws.com
60	60	1	Wallie Schleswig-H...	Female	60	814 839 0927	wschleswigholsteinln@newsvine...
61	61	2	Ilise Northover	Female	61	288 559 8632	inorthoverlo@pbs.org
62	62	1	Yorgos Bagehot	Male	62	306 340 5856	ybagehotlp@wsj.com
63	63	1	Sammy Tilberry	Male	63	901 564 6081	stilberrylq@chron.com
64	64	2	Lorrin Proffitt	Female	64	612 139 1280	lproffittlr@t.co
65	65	2	Wendie Taggert	Female	65	759 671 7010	wtaggertls@springer.com

-- Equipment Table

128	128	FALL ARRESTOR 6M HORIZONTAL	4500	2000	JCB	11
129	129	ROOFERS KIT	5400	2009	Kobelco	11
130	130	SAFETY HARNESS	2520	2004	Bobcat	11
131	131	ROOFER LIFELINE HORIZONTAL SYSTEM 18M	6500	2004	Kobelco	11
132	132	TOILET (X2) FRESHWATER WITH TRAILER	25200	2016	Volvo	12
133	133	TOILET (X3) FRESHWATER WITH TRAILER	33600	2001	Kobelco	12
134	134	TOILET ACCESSIBLE	8640	2015	Yanmar	12
135	135	SHOWER SINGLE PORTABLE	6240	2015	Komatsu	12
136	136	WASH STATION PORTABLE	3000	2017	Kenworth	12
137	137	PROP HIGH LOAD 4.30M - 6.25M	1040	2010	Yanmar	12
138	138	TIPPING SKIPS	4320	2001	Kobelco	12
139	139	BIN - 240L	1200	2010	Komatsu	12
140	140	WASTE BIN 0.7 CUB.M	3840	2002	Yanmar	12
141	141	TRAILER - BOX 1.8M X 1.2M (6FT X 4FT)	5200	2001	Bobcat	13
142	142	TRAILER - ENCLOSED LARGE	18000	2007	Volvo	13
143	143	TRAILER - ENCLOSED MEDIUM	7200	2002	Case	13
144	144	TRAILER - FURNITURE	4800	2014	Kenworth	13
145	145	TRAILER - CAGE MEDIUM	8400	2004	Volvo	13
146	146	TRAILER - CAGE LARGE TANDEM	10560	2017	Hitachi	13
147	147	TRAILER - FLAT TOP	14520	2004	Kenworth	13
148	148	TRAILER - PLANT/DROP DECK	6720	2015	Volvo	13
149	149	TRAILER - PLANT/MACHINERY SMALL	7200	2002	Komatsu	13
150	150	TRAILER - EXCAVATOR	6480	2017	Caterpillar	13
151	151	TRAILER - BIKE	3600	2012	Kobelco	13
152	152	TABLETOP 1T AUTO	10800	2000	Kobelco	14
153	153	VAN - 1T	16800	2005	JCB	14
154	154	TIPPER 2T	23400	2006	Hitachi	14
155	155	TIPPER CREW CAB	16000	2008	Caterpillar	14
156	156	TIPPER 5T	31200	2013	JCB	14
157	157	TRAILER - LIVESTOCK	14400	2010	Volvo	14

-- Hire Table

	HIRE_ID	START_DATE	END_DATE	EQUIPMENT_ID	QUANTITY	UNIT_HIRE_PRICE	TOTAL_HIRE_PRICE	CUSTOMER_ID	STAFF_ID
1	1	11-MAY-18	14-MAY-18	135	3	80	720	77	2
2	2	17-MAY-18	20-MAY-18	49	2	660	3960	70	38
3	3	18-MAY-18	19-MAY-18	117	1	150	150	58	17
4	4	21-MAY-18	25-MAY-18	36	1	540	2160	124	41
5	5	21-MAY-18	23-MAY-18	37	2	600	2400	87	35
6	6	22-MAY-18	26-MAY-18	53	2	500	4000	15	31
7	7	24-MAY-18	28-MAY-18	73	3	140	1680	77	10
8	8	25-MAY-18	28-MAY-18	135	3	80	720	140	40
9	9	28-MAY-18	28-MAY-18	127	2	170	170	8	46
10	10	29-MAY-18	29-MAY-18	86	2	200	200	5	28
11	11	12-JUN-18	14-JUN-18	71	2	450	1800	145	21
12	12	15-JUN-18	15-JUN-18	23	2	360	360	74	43
13	13	24-JUN-18	25-JUN-18	61	3	150	450	114	10
14	14	25-JUN-18	25-JUN-18	85	3	210	315	110	44
15	15	30-JUN-18	01-JUL-18	9	1	360	360	47	8
16	16	05-JUL-18	05-JUL-18	74	1	280	140	129	7
17	17	07-JUL-18	08-JUL-18	85	2	250	500	134	44
18	18	12-JUL-18	14-JUL-18	25	3	600	3600	114	3
19	19	13-JUL-18	14-JUL-18	112	1	300	300	135	47
20	20	13-JUL-18	14-JUL-18	141	3	80	240	71	28
21	21	14-JUL-18	15-JUL-18	145	2	100	200	7	33
22	22	23-JUL-18	24-JUL-18	4	1	395	395	110	15
23	23	26-JUL-18	27-JUL-18	125	3	140	420	19	44
24	24	27-JUL-18	29-JUL-18	99	2	20	80	63	5
25	25	27-JUL-18	29-JUL-18	147	1	220	440	19	2
26	26	30-JUL-18	03-AUG-18	22	3	450	5400	113	27
27	27	01-AUG-18	03-AUG-18	10	2	360	1440	99	47
28	29	01-AUG-18	02-AUG-18	31	3	120	360	3	33
29	28	01-AUG-18	05-AUG-18	133	2	600	4800	126	28
30	30	04-AUG-18	04-AUG-18	64	1	220	110	79	34

-- Sales Table

	SALES_ID	SALES_DATE	EQUIPMENT_ID	QUANTITY	UNIT_SALES_PRICE	TOTAL_SALES_P...	CUSTOMER_ID	STAFF_ID
1	55	18-MAR-19	136	1	5000	5000	87	47
2	16	07-AUG-18	99	2	2800	5600	69	10
3	109	09-MAY-20	103	1	6400	6400	134	27
4	80	12-OCT-19	126	1	9600	9600	90	50
5	58	30-APR-19	41	1	10000	10000	119	19
6	15	31-JUL-18	123	2	5600	11200	1	26
7	95	08-JAN-20	82	1	11200	11200	122	6
8	98	11-FEB-20	104	2	5600	11200	67	28
9	28	20-SEP-18	104	2	5600	11200	58	40
10	146	20-NOV-20	130	3	4200	12600	51	35
11	35	27-OCT-18	145	1	14000	14000	72	32
12	20	18-AUG-18	145	1	14000	14000	66	36
13	137	14-OCT-20	143	1	14400	14400	34	17
14	18	08-AUG-18	107	3	4800	14400	59	21
15	106	22-APR-20	118	1	15600	15600	61	33
16	145	14-NOV-20	75	1	16000	16000	100	36
17	82	26-OCT-19	104	3	5600	16800	134	7
18	49	10-FEB-19	123	3	5600	16800	55	21
19	81	20-OCT-19	146	1	17600	17600	40	21
20	75	04-SEP-19	34	1	18000	18000	50	1
21	73	05-AUG-19	34	1	18000	18000	19	17
22	67	01-JUL-19	120	2	9000	18000	74	1
23	63	22-MAY-19	152	1	18000	18000	70	14
24	17	08-AUG-18	27	1	18000	18000	72	21
25	4	05-JUN-18	151	2	9000	18000	150	16
26	2	17-APR-18	128	2	9000	18000	72	29
27	144	10-NOV-20	151	2	9000	18000	25	46
28	26	15-SEP-18	72	2	9600	19200	81	43
29	7	09-JUL-18	95	1	19200	19200	106	3
30	56	31-MAR-19	107	4	4800	19200	120	16

Task C.3

a)

SQL Statements Star Schema Version 1

Star Schema Version 1

-- Create Dimension Tables

-- CompanyBranchDIM_V1

CREATE SEQUENCE branch_id_seq START WITH 1 INCREMENT BY 1 MAXVALUE 15 NOCYCLE;

```
CREATE TABLE companybranchdim_v1
  AS
    SELECT
      branch_id_seq.NEXTVAL AS branchid,
      branch_desc
    FROM
      (
        SELECT DISTINCT
          company_branch AS branch_desc
        FROM
          staff
        ORDER BY
          company_branch
      ) ordered_branches;
```

-- TimeDIM_V1

CREATE TABLE timedim_v1

```
AS
    SELECT DISTINCT
        to_char(d, 'yyyymm') AS timeid,
        to_char(d, 'yyyy')   AS year,
        to_char(d, 'MONTH')  AS month
    FROM
        (
            SELECT
                start_date AS d
            FROM
                hire
            UNION
            SELECT
                sales_date AS d
            FROM
                sales
        )
    ORDER BY
        year,
        to_char(TO_DATE(month, 'MONTH'),
                'MM');
```

-- SeasonDIM_V1

```
CREATE TABLE seasondim_v1 (
    seasonid         CHAR(1),
    season_desc      VARCHAR2(20),
    season_startdate VARCHAR2(10),
    season_enddate   VARCHAR2(10)
```

```
);

-- Summer Dec-Feb
INSERT INTO seasondim_v1 VALUES (
    1,
    'Summer',
    '01-DEC',
    '29-FEB'
);

-- Autumn Feb-May
INSERT INTO seasondim_v1 VALUES (
    2,
    'Autumn',
    '01-MAR',
    '31-MAY'
);

-- Winter Jun-Aug
INSERT INTO seasondim_v1 VALUES (
    3,
    'Winter',
    '01-JUN',
    '31-AUG'
);

-- Spring Sep-Nov
INSERT INTO seasondim_v1 VALUES (
```

```
    4,
    'Spring',
    '01-SEP',
    '30-NOV'
);

-- CategoryDIM_V1
CREATE TABLE categorydim_v1
    AS
        SELECT
            category_id          AS categoryid,
            category_description AS category_desc
        FROM
            category;

-- CustomerTypeDIM_V1
CREATE TABLE customertypedim_v1
    AS
        SELECT
            customer_type_id AS customertypeid,
            description      AS customertype_desc
        FROM
            customer_type;

-- PriceScaleDIM_V1
CREATE TABLE pricescaledim_v1 (
    scaleid          VARCHAR2(10),
    scale_desc       VARCHAR2(50),
```

```
    scale_lowerbound NUMBER(10),
    scale_upperbound NUMBER(10)
);

INSERT INTO pricescaledim_v1 VALUES (
    1,
    'LOW',
    0,
    4999
);

INSERT INTO pricescaledim_v1 VALUES (
    2,
    'MEDIUM',
    5000,
    10000
);

INSERT INTO pricescaledim_v1 VALUES (
    3,
    'HIGH',
    10001,
    power(10, 10) - 1
);
```

```
-----------------------------------------
-- Create Fact Tables
-----------------------------------------

-- HireFact_V1
CREATE TABLE hirefact_v1
  AS
    SELECT
      to_char(hi.start_date, 'YYYYMM') AS timeid,
      CASE
        WHEN to_char(hi.start_date, 'MM') IN ( '12', '01', '02' ) THEN
          1
        WHEN to_char(hi.start_date, 'MM') BETWEEN '03' AND '05' THEN
          2
        WHEN to_char(hi.start_date, 'MM') BETWEEN '06' AND '08' THEN
          3
        WHEN to_char(hi.start_date, 'MM') BETWEEN '09' AND '11' THEN
          4
      END                         AS seasonid,
      eq.category_id              AS categoryid,
      ct.customer_type_id         AS customertypeid,
      cb.branchid,
      SUM(hi.total_hire_price)    AS totalhirerevenue,
      COUNT(*)                    AS num_of_hired_transaction,
      SUM(hi.quantity)            AS num_of_hired_equip
    FROM
        hire hi
      JOIN equipment       eq ON eq.equipment_id = hi.equipment_id
```

```
    JOIN customer_clean      ct ON ct.customer_id = hi.customer_id
    JOIN staff               st ON st.staff_id = hi.staff_id
    JOIN companybranchdim_v1 cb ON cb.branch_desc = st.company_branch
  GROUP BY
    to_char(hi.start_date, 'YYYYMM'),
    CASE
        WHEN to_char(hi.start_date, 'MM') IN ( '12', '01', '02' ) THEN
          1
        WHEN to_char(hi.start_date, 'MM') BETWEEN '03' AND '05' THEN
          2
        WHEN to_char(hi.start_date, 'MM') BETWEEN '06' AND '08' THEN
          3
        WHEN to_char(hi.start_date, 'MM') BETWEEN '09' AND '11' THEN
          4
    END,
    eq.category_id,
    ct.customer_type_id,
    cb.branchid;

-- SalesFact_V1
CREATE TABLE salesfact_v1
  AS
    SELECT
      to_char(sl.sales_date, 'yyyymm') AS timeid,
      CASE
        WHEN to_char(sl.sales_date, 'mm') IN ( 12, 01, 02 ) THEN
          1
        WHEN to_char(sl.sales_date, 'mm') BETWEEN 03 AND 05 THEN
```

```
        2
      WHEN to_char(sl.sales_date, 'mm') BETWEEN 06 AND 08 THEN
        3
      WHEN to_char(sl.sales_date, 'mm') BETWEEN 09 AND 11 THEN
        4
    END                         AS seasonid,
    eq.category_id              AS categoryid,
    ct.customer_type_id         AS customertypeid,
    cb.branchid,
    CASE
      WHEN sl.total_sales_price < 5000  THEN
        1
      WHEN sl.total_sales_price > 10000 THEN
        3
      ELSE
        2
    END                         AS scaleid,
    SUM(sl.total_sales_price)   AS totalsalesrevenue,
    COUNT(*)                    AS num_of_sold_transaction,
    SUM(sl.quantity)            AS num_of_sold_equip
FROM
      sales sl
    JOIN equipment          eq ON eq.equipment_id = sl.equipment_id
    JOIN customer_clean     ct ON ct.customer_id = sl.customer_id
    JOIN staff              st ON st.staff_id = sl.staff_id
    JOIN companybranchdim_v1 cb ON cb.branch_desc = st.company_branch
GROUP BY
      CASE
```

```
   WHEN sl.total_sales_price < 5000  THEN
      1
   WHEN sl.total_sales_price > 10000 THEN
      3
   ELSE
      2
END,
to_char(sl.sales_date, 'yyyymm'),
CASE
   WHEN to_char(sl.sales_date, 'mm') IN ( 12, 01, 02 ) THEN
      1
   WHEN to_char(sl.sales_date, 'mm') BETWEEN 03 AND 05 THEN
      2
   WHEN to_char(sl.sales_date, 'mm') BETWEEN 06 AND 08 THEN
      3
   WHEN to_char(sl.sales_date, 'mm') BETWEEN 09 AND 11 THEN
      4
END,
eq.category_id,
ct.customer_type_id,
cb.branchid;
```

b)

SQL Statements Star Schema Version 2

Star Schema Version 2

```
-----------------------------------------------
-- Create Dimension Tables
-----------------------------------------------

-- StaffDIM_V2
CREATE TABLE staffdim_v2
   AS
      SELECT
         *
      FROM
         staff;

--EquipmentDIM_V2
CREATE TABLE equipmentdim_v2
   AS
      SELECT
         *
      FROM
         equipment;

--CustomerDIM_V2
CREATE TABLE customerdim_v2
   AS
      SELECT
         *
```

```
    FROM
        customer_clean;

--HireDIM_V2
CREATE TABLE hiredim_v2
  AS
    SELECT
        hire_id AS hireid,
        start_date,
        end_date,
        quantity,
        unit_hire_price,
        total_hire_price
    FROM
        hire;

--SalesDIM_V2
CREATE TABLE salesdim_v2
  AS
    SELECT
        sales_id AS salesid,
        sales_date,
        quantity,
        unit_sales_price,
        total_sales_price
    FROM
        sales;
```

```
-------------------------------------------
-- Create Fact Tables
-------------------------------------------
-- HiringFact_V2
CREATE TABLE hiringfact_v2
  AS
    SELECT
      st.staff_id,
      eq.equipment_id,
      hi.hire_id,
      cc.customer_id,
      SUM(hi.total_hire_price) AS totalhirerevenue
    FROM
        hire hi
      JOIN staff          st ON st.staff_id = hi.staff_id
      JOIN equipment      eq ON eq.equipment_id = hi.equipment_id
      JOIN customer_clean cc ON cc.customer_id = hi.customer_id
    GROUP BY
      st.staff_id,
      eq.equipment_id,
      hi.hire_id,
      cc.customer_id;

--SellingFact_V2
CREATE TABLE sellingfact_v2
  AS
    SELECT
      st.staff_id,
```

```
    eq.equipment_id,
    sl.sales_id,
    cc.customer_id,
    SUM(sl.total_sales_price) AS totalsalesrevenue
FROM
        sales sl
    JOIN staff          st ON st.staff_id = sl.staff_id
    JOIN equipment      eq ON eq.equipment_id = sl.equipment_id
    JOIN customer_clean cc ON cc.customer_id = sl.customer_id
GROUP BY
    st.staff_id,
    eq.equipment_id,
    sl.sales_id,
    cc.customer_id;
```

c)

Screenshots of the implementation and the tables

Star Schema Version 1

- ***CompanyBranchDIM_V1***

```
-- CompanyBranchDIM_V1
CREATE SEQUENCE branch_id_seq START WITH 1 INCREMENT BY 1 MAXVALUE 15 NOCYCLE;

CREATE TABLE companybranchdim_v1
    AS
        SELECT
            branch_id_seq.NEXTVAL AS branchid,
            branch_desc
        FROM
            (
                SELECT DISTINCT
                    company_branch AS branch_desc
                FROM
                    staff
                ORDER BY
                    company_branch
            ) ordered_branches;
```

	BRANCHID	BRANCH_DESC
1	1	Caulfield
2	2	Chadstone
3	3	Cheltenham
4	4	Clayton
5	5	Dandenong
6	6	Docklands
7	7	Eltham
8	8	Fitzroy
9	9	Geelong
10	10	Hughesdale
11	11	Pakenham
12	12	Parkville
13	13	Prahran
14	14	Richmond
15	15	Toorak

- ***TimeDIM_V1***

```
-- TimeDIM_V1
CREATE TABLE timedim_v1
    AS
        SELECT DISTINCT
            to_char(d, 'yyyymm') AS timeid,
            to_char(d, 'yyyy')   AS year,
            to_char(d, 'MONTH')  AS month
        FROM
            (
                SELECT
                    start_date AS d
                FROM
                    hire
                UNION
                SELECT
                    sales_date AS d
                FROM
                    sales
            )
        ORDER BY
            year,
            to_char(TO_DATE(month, 'MONTH'),
                    'MM');
```

	TIMEID	YEAR	MONTH
1	201804	2018	APRIL
2	201805	2018	MAY
3	201806	2018	JUNE
4	201807	2018	JULY
5	201808	2018	AUGUST
6	201809	2018	SEPTEMBER
7	201810	2018	OCTOBER
8	201811	2018	NOVEMBER
9	201812	2018	DECEMBER
10	201901	2019	JANUARY
11	201902	2019	FEBRUARY
12	201903	2019	MARCH
13	201904	2019	APRIL
14	201905	2019	MAY
15	201906	2019	JUNE
16	201907	2019	JULY
17	201908	2019	AUGUST
18	201909	2019	SEPTEMBER
19	201910	2019	OCTOBER
20	201911	2019	NOVEMBER
21	201912	2019	DECEMBER
22	202001	2020	JANUARY
23	202002	2020	FEBRUARY
24	202003	2020	MARCH
25	202004	2020	APRIL
26	202005	2020	MAY
27	202006	2020	JUNE
28	202007	2020	JULY
29	202008	2020	AUGUST
30	202009	2020	SEPTEMBER

- ***SeasonDIM_V1***

```
-- SeasonDIM_V1
CREATE TABLE seasondim_v1 (
    seasonid         CHAR(1),
    season_desc      VARCHAR2(20),
    season_startdate VARCHAR2(10),
    season_enddate   VARCHAR2(10)
);

-- Summer Dec-Feb
INSERT INTO seasondim_v1 VALUES (
    1,
    'Summer',
    '01-DEC',
    '29-FEB'
);

-- Autumn Feb-May
INSERT INTO seasondim_v1 VALUES (
    2,
    'Autumn',
    '01-MAR',
    '31-MAY'
);

-- Winter Jun-Aug
INSERT INTO seasondim_v1 VALUES (
    3,
    'Winter',
    '01-JUN',
    '31-AUG'
);

-- Spring Sep-Nov
INSERT INTO seasondim_v1 VALUES (
    4,
```

	SEASONID	SEASON_DESC	SEASON_STARTDATE	SEASON_ENDDATE
1	1	Summer	01-DEC	29-FEB
2	2	Autumn	01-MAR	31-MAY
3	3	Winter	01-JUN	31-AUG
4	4	Spring	01-SEP	30-NOV

- ***CategoryDIM_V1***

```
-- CategoryDIM_V1
CREATE TABLE categorydim_v1
    AS
        SELECT
            category_id          AS categoryid,
            category_description AS category_desc
        FROM
            category;
```

	CATEGORYID	CATEGORY_DESC
1	1	Access
2	2	Air Compressor
3	3	Compaction
4	4	Concrete
5	5	Earthmoving
6	6	Generators
7	7	Landscaping
8	8	Lighting
9	9	Plumbing
10	10	Rail
11	11	Safety
12	12	Site Equipment
13	13	Trailers
14	14	Vehicles

- ***CustomerTypeDIM_V1***

```
-- CustomerTypeDIM_V1
CREATE TABLE customertypedim_v1
    AS
        SELECT
            customer_type_id AS customertypeid,
            description      AS customertype_desc
        FROM
            customer_type;
```

	CUSTOMERTYPEID	CUSTOMERTYPE_DESC
1	1	Individual
2	2	Business

- ***PriceScaleDIM_V1***

```
-- PriceScaleDIM_V1
CREATE TABLE pricescaledim_v1 (
    scaleid          VARCHAR2(10),
    scale_desc       VARCHAR2(50),
    scale_lowerbound NUMBER(10),
    scale_upperbound NUMBER(10)
);

INSERT INTO pricescaledim_v1 VALUES (
    1,
    'LOW',
    0,
    4999
);

INSERT INTO pricescaledim_v1 VALUES (
    2,
    'MEDIUM',
    5000,
    10000
);

INSERT INTO pricescaledim_v1 VALUES (
    3,
    'HIGH',
    10001,
    power(10, 10) - 1
);
```

	SCALEID	SCALE_DESC	SCALE_LOWERBOUND	SCALE_UPPERBOUND
1	1	LOW	0	4999
2	2	MEDIUM	5000	10000
3	3	HIGH	10001	9999999999

- ***HireFact_V1***

```
147 CREATE TABLE hirefact_v1
148     AS
149         SELECT
150             to_char(hi.start_date, 'YYYYMM') AS timeid,
151             CASE
152                 WHEN to_char(hi.start_date, 'MM') IN ( '12', '01', '02' ) THEN
153                     1
154                 WHEN to_char(hi.start_date, 'MM') BETWEEN '03' AND '05' THEN
155                     2
156                 WHEN to_char(hi.start_date, 'MM') BETWEEN '06' AND '08' THEN
157                     3
158                 WHEN to_char(hi.start_date, 'MM') BETWEEN '09' AND '11' THEN
159                     4
160             END                                 AS seasonid,
161             eq.category_id                      AS categoryid,
162             ct.customer_type_id                 AS customertypeid,
163             cb.branchid,
164             SUM(hi.total_hire_price)            AS totalhirerevenue,
165             COUNT(*)                            AS num_of_hired_transaction,
166             SUM(hi.quantity)                    AS num_of_hired_equip
167         FROM
168                  hire hi
169             JOIN equipment           eq ON eq.equipment_id = hi.equipment_id
170             JOIN customer_clean      ct ON ct.customer_id = hi.customer_id
171             JOIN staff               st ON st.staff_id = hi.staff_id
172             JOIN companybranchdim_v1 cb ON cb.branch_desc = st.company_branch
173         GROUP BY
174             to_char(hi.start_date, 'YYYYMM'),
175             CASE
176                     WHEN to_char(hi.start_date, 'MM') IN ( '12', '01', '02' ) THEN
177                         1
178                     WHEN to_char(hi.start_date, 'MM') BETWEEN '03' AND '05' THEN
179                         2
180                     WHEN to_char(hi.start_date, 'MM') BETWEEN '06' AND '08' THEN
181                         3
```

	TIMEID	SEASONID	CATEGORYID	CUSTOMERTYPEID	BRANCHID	TOTALHIREREVENUE	NUM_OF_HIRED_TRANSACTION	NUM_OF_HIRED_EQUIP
1	201805	2	5	1	14	4000	1	2
2	201807	3	9	1	4	80	1	2
3	201808	3	1	2	10	1440	1	2
4	201810	4	9	2	12	1260	1	1
5	201811	4	2	1	10	3200	1	2
6	201812	1	9	2	1	40	1	1
7	201812	1	1	1	11	890	1	1
8	201812	1	10	2	2	1560	1	3
9	201901	1	1	2	8	900	1	3
10	201903	2	10	1	14	480	1	1
11	201904	2	2	2	13	3000	1	3
12	201904	2	8	1	3	700	1	1
13	201905	2	5	1	5	1350	1	3
14	201905	2	3	1	10	1440	1	3
15	201906	3	7	2	2	3600	1	2
16	201906	3	8	2	7	600	1	3
17	201906	3	2	2	4	760	1	2
18	201907	3	5	2	13	675	1	3
19	201907	3	12	2	15	100	1	2

- ***SalesFact_V1***

```
CREATE TABLE salesfact_v1
    AS
        SELECT
            to_char(sl.sales_date, 'yyyymm') AS timeid,
            CASE
                WHEN to_char(sl.sales_date, 'mm') IN ( 12, 01, 02 ) THEN
                    1
                WHEN to_char(sl.sales_date, 'mm') BETWEEN 03 AND 05 THEN
                    2
                WHEN to_char(sl.sales_date, 'mm') BETWEEN 06 AND 08 THEN
                    3
                WHEN to_char(sl.sales_date, 'mm') BETWEEN 09 AND 11 THEN
                    4
            END                                 AS seasonid,
            eq.category_id                      AS categoryid,
            ct.customer_type_id                 AS customertypeid,
            cb.branchid,
            CASE
                WHEN sl.total_sales_price < 5000  THEN
                    1
                WHEN sl.total_sales_price > 10000 THEN
                    3
                ELSE
                    2
            END                                 AS scaleid,
            SUM(sl.total_sales_price)           AS totalsalesrevenue,
            COUNT(*)                            AS num_of_sold_transaction,
            SUM(sl.quantity)                    AS num_of_sold_equip
        FROM
                 sales sl
            JOIN equipment           eq ON eq.equipment_id = sl.equipment_id
            JOIN customer_clean      ct ON ct.customer_id = sl.customer_id
            JOIN staff               st ON st.staff_id = sl.staff_id
            JOIN companybranchdim_v1 cb ON cb.branch_desc = st.company_branch
        GROUP BY
            CASE
```

	TIMEID	SEASONID	CATEGORYID	CUSTOMERTYPEID	BRANCHID	SCALEID	TOTALSALESREVENUE	NUM_OF_SOLD_TRANSACTION	NUM_OF_SOLD_EQUIP
1	201807	3	3	2	12	3	60000	1	3
2	201807	3	11	1	8	3	11200	1	2
3	201808	3	11	1	4	3	43200	1	2
4	201809	4	7	2	4	3	19200	1	2
5	201809	4	11	2	4	3	38400	1	4
6	201809	4	1	2	6	3	214500	1	3
7	201810	4	1	1	15	3	63000	1	2
8	201811	4	7	1	4	3	126000	1	2
9	201903	2	10	2	9	3	80000	1	2
10	201905	2	7	2	11	3	72800	1	4
11	201907	3	11	1	1	3	18000	1	2
12	201909	4	6	2	12	3	120000	1	4
13	201910	4	1	2	4	3	154050	1	3
14	201911	4	13	2	10	3	43200	1	3

Star Schema Version 2

- ***StaffDIM_V2***

```
-- StaffDIM_V2
CREATE TABLE staffdim_v2
    AS
        SELECT
            *
        FROM
            staff;
```

	STAFF_ID	FIRST_NAME	LAST_NAME	GENDER	PHONE	EMAIL	COMPANY_BRANCH
1	1	Carleen	Razzell	Female	323 545 5764	carleen.razzell@monequip.com.au	Caulfield
2	2	Ailee	Paxeford	Female	987 455 1555	ailee.paxeford@monequip.com.au	Hughesdale
3	3	Elissa	Danovich	Female	286 378 7209	elissa.danovich@monequip.com.au	Clayton
4	4	Sonnnie	Chestnutt	Female	245 231 1339	sonnnie.chestnutt@monequip.com.au	Toorak
5	5	Mariska	Holtum	Female	262 960 8943	mariska.holtum@monequip.com.au	Clayton
6	6	Egbert	Earl	Male	290 507 8778	egbert.earl@monequip.com.au	Eltham
7	7	Marylinda	Chanders	Female	398 888 9947	marylinda.chanders@monequip.com.au	Chadstone
8	8	Marcella	Diggons	Female	395 748 7317	marcella.diggons@monequip.com.au	Docklands
9	9	Bethina	Gateman	Female	891 703 6967	bethina.gateman@monequip.com.au	Parkville
10	10	Felecia	Stobbart	Female	735 724 1655	felecia.stobbart@monequip.com.au	Caulfield

- ***EquipmentDIM_V2***

```
--EquipmentDIM_V2
CREATE TABLE equipmentdim_v2
    AS
        SELECT
            *
        FROM
            equipment;
```

	CUSTOMER_ID	CUSTOMER_TYPE_ID	NAME	GENDER	ADDRESS_ID	PHONE	EMAIL
1	1	1	Regina Isaacson	Female	1	601 627 5878	risaacson0@tamu.edu
2	2	2	Jaime Whate	Male	2	318 998 0883	jwhatel@ucoz.ru
3	3	1	Thaine Hirche	Male	3	276 571 7986	thirche2@reference.com
4	4	1	Deirdre Reddington	Female	4	585 183 1946	dreddington3@cloudflare.com
5	5	1	Domenic Kirrens	Male	5	798 585 9171	dkirrens4@virginia.edu
6	6	1	Kerk Petera	Male	6	856 940 2206	kpetera5@fastcompany.com
7	7	1	Pammie Futter	Female	7	891 227 4556	pfutter6@woothemes.com
8	8	2	Blaire Christopherson	Female	8	872 144 2174	bchristopherson7@photobucket.com
9	9	1	Gaye Kemmis	Female	9	746 484 4734	gkemmis8@vimeo.com
10	10	2	Cherise Alessandretti	Female	10	501 251 3910	calessandretti9@auda.org.au
11	11	2	Kimmi Deeks	Female	11	128 972 8249	kdeeksa@who.int
12	12	1	Leticia Braiden	Female	12	267 506 7875	lbraidenb@dailymail.co.uk

- ***CustomerDIM_V2***

```
--CustomerDIM_V2
CREATE TABLE customerdim_v2
    AS
        SELECT
            *
        FROM
            customer_clean;
```

	EQUIPMENT_ID	EQUIPMENT_NAME	EQUIPMENT_PRICE	MANUFACTURE_YEAR	MANUFACTURER	CATEGORY_ID
1	1	SCISSORLIFT 3.0M (10FT) MANUAL	27000	2001	Kenworth	1
2	2	MANLIFT 4.75M (15FT) SELF PROPELLED	15750	2000	Hitachi	1
3	3	SCISSORLIFT 5.8M (19FT) ELECTRIC	10800	2008	Volvo	1
4	4	SCISSORLIFT 5.8M (19FT) TRACKED BI-LEVELLING NARROW	20540	2016	Kobelco	1
5	5	SCISSORLIFT 7.7M (26FT) ELECTRIC NARROW	15600	2007	Yanmar	1
6	6	MOBILE HYDRAULIC PLATFORM 19M TRACKED	35750	2013	Caterpillar	1
7	7	MOBILE HYDRAULIC PLATFORM 9M TRACKED	22200	2013	Isuzu	1
8	8	MOBILE HYDRAULIC PLATFORM 12M	25200	2005	Volvo	1
9	9	BOOMLIFT 18M (60FT) DIESEL/ELECTRIC 4WD	21600	2011	Caterpillar	1
10	10	BOOMLIFT 9M (30FT) ELECTRIC	20160	2014	Kubota	1
11	11	BOOMLIFT 10.2M (34FT) DIESEL/ELECTRIC 4WD	14400	2000	Hitachi	1
12	12	MANLIFT 8M SELF PROPELLED	14560	2009	Komatsu	1
13	13	MANLIFT 6M (19FT) SELF PROPELLED	30000	2010	Volvo	1
14	14	AIR COMPRESSOR 2.1 CFM 12V	780	2015	Case	2

- ***HireDIM_V2***

```
--HireDIM_V2
CREATE TABLE hiredim_v2
    AS
        SELECT
            hire_id,
            start_date,
            end_date,
            quantity,
            unit_hire_price,
            total_hire_price
        FROM
            hire;
```

	HIRE_ID	START_DATE	END_DATE	QUANTITY	UNIT_HIRE_PRICE	TOTAL_HIRE_PRICE
1	1	11-MAY-18	14-MAY-18	3	80	720
2	2	17-MAY-18	20-MAY-18	2	660	3960
3	3	18-MAY-18	19-MAY-18	1	150	150
4	4	21-MAY-18	25-MAY-18	1	540	2160
5	5	21-MAY-18	23-MAY-18	2	600	2400
6	6	22-MAY-18	26-MAY-18	2	500	4000
7	7	24-MAY-18	28-MAY-18	3	140	1680
8	8	25-MAY-18	28-MAY-18	3	80	720
9	9	28-MAY-18	28-MAY-18	2	170	170
10	10	29-MAY-18	29-MAY-18	2	200	200

- ***SalesDIM_V2***

```
--SalesDIM_V2
CREATE TABLE salesdim_v2
    AS
        SELECT
            sales_id,
            sales_date,
            quantity,
            unit_sales_price,
            total_sales_price
        FROM
            sales;
```

	SALES_ID	SALES_DATE	QUANTITY	UNIT_SALES_PRICE	TOTAL_SALES_PRICE
1	1	09-APR-18	3	11000	33000
2	2	17-APR-18	2	9000	18000
3	3	10-MAY-18	2	41600	83200
4	4	05-JUN-18	2	9000	18000
5	5	06-JUL-18	4	65000	260000
6	6	07-JUL-18	1	63000	63000
7	7	09-JUL-18	1	19200	19200
8	8	09-JUL-18	4	84500	338000
9	9	10-JUL-18	3	54000	162000
10	10	10-JUL-18	4	54000	216000

- ***HiringFact_V2***

```
-- HiringFact_V2
CREATE TABLE hiringfact_v2
    AS
        SELECT
            st.staff_id,
            eq.equipment_id,
            hi.hire_id,
            cc.customer_id,
            SUM(hi.total_hire_price) AS totalhirerevenue
        FROM
                hire hi
            JOIN staff          st ON st.staff_id = hi.staff_id
            JOIN equipment      eq ON eq.equipment_id = hi.equipment_id
            JOIN customer_clean cc ON cc.customer_id = hi.customer_id
        GROUP BY
            st.staff_id,
            eq.equipment_id,
            hi.hire_id,
            cc.customer_id;
```

	STAFF_ID	EQUIPMENT_ID	HIRE_ID	CUSTOMER_ID	TOTALHIREREVENUE
1	2	135	1	77	720
2	10	73	7	77	1680
3	44	125	23	19	420
4	47	10	27	99	1440
5	33	31	29	3	360
6	28	133	28	126	4800
7	42	112	37	81	680
8	48	86	53	129	200
9	36	138	64	13	45
10	2	23	65	32	3200

- ***SellingFact_V2***

```
--SellingFact_V2
CREATE TABLE sellingfact_v2
    AS
        SELECT
            st.staff_id,
            eq.equipment_id,
            sl.sales_id,
            cc.customer_id,
            SUM(sl.total_sales_price) AS totalsalesrevenue
        FROM
                sales sl
            JOIN staff          st ON st.staff_id = sl.staff_id
            JOIN equipment      eq ON eq.equipment_id = sl.equipment_id
            JOIN customer_clean cc ON cc.customer_id = sl.customer_id
        GROUP BY
            st.staff_id,
            eq.equipment_id,
            sl.sales_id,
            cc.customer_id;
```

	STAFF_ID	EQUIPMENT_ID	SALES_ID	CUSTOMER_ID	TOTALSALESREVENUE
1	21	5	57	84	156000
2	8	6	30	64	214500
3	16	20	84	120	91000
4	13	22	71	35	90000
5	35	25	138	70	198000
6	4	28	104	139	60000
7	5	29	68	87	52800
8	22	32	13	81	60000
9	11	41	133	49	40000
10	38	43	103	70	22500