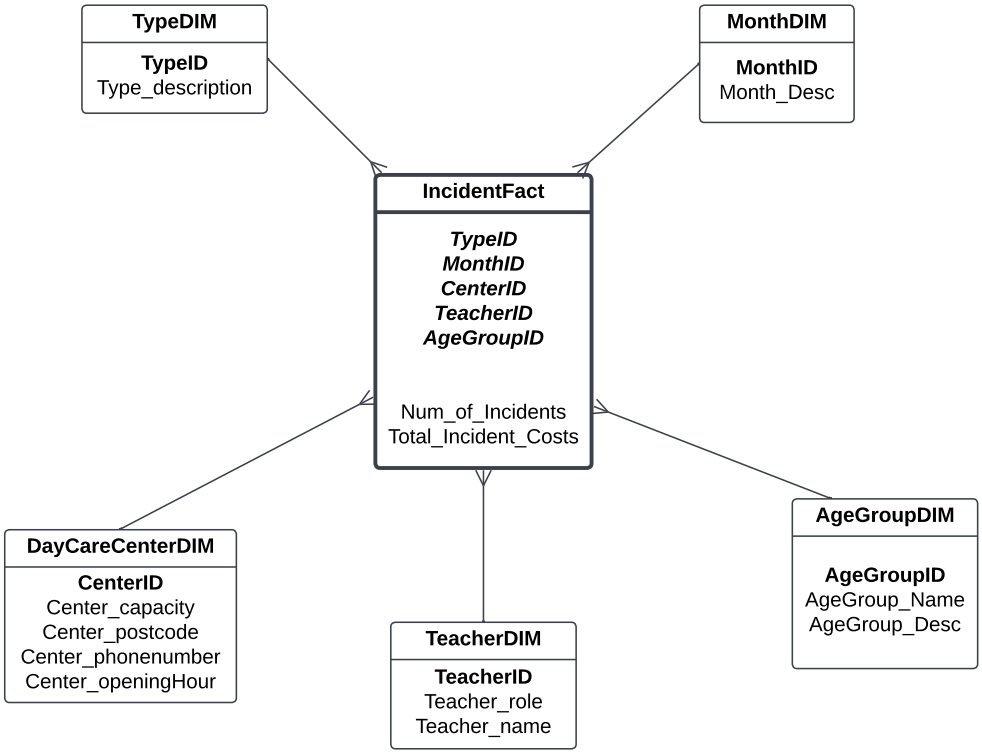
FIT5137 S2 2023 Assignment 1: Take home test

Task 1. The star schema diagram



From the case study, it is mentioned that the number of incidents and total incident costs should be analysed by incident type, month, daycare center, teacher, and age group points of view. As a result, this star schema includes the dimensions of type, month, daycare center, teacher, and age group. Two fact measures, Num_of_incidents and Total_Incident_Costs, are included in the fact table.

Task 2. The Two-Column Table Methodology illustration

TypeID	Num_of_Incidents	Total_Incident_Costs
T1	10	$438
T2	87	$6,202
T3	116	$8,607
T4	112	$7,951
T5	107	$7,268
T6	104	$6,015

MonthID	Num_of_Incidents	Total_Incident_Costs
01	106	$4,990
02	103	$5,973
03	116	$7,137
04	77	$4,616
05	30	$3,282
06	36	$3,897
07	35	$3,084
08	33	$3,502

CenterID	Num_of_Incidents	Total_Incident_Costs
CE1	218	$16,147
CE2	169	$11,078
CE3	149	$9,256

TeacherID	Num_of_Incidents	Total_Incident_Costs
TE1	10	$438
TE2	17	$1,534
TE3	43	$2,617
TE4	38	$2,535
TE5	50	$2,908
TE6	52	$3,713
TE7	44	$2,812
TE8	39	$2,465
TE9	11	$1,203
TE10	23	$1,650
TE11	23	$1,614
TE12	33	$1,983

TE13	38	$3,101
TE14	29	$1,767
TE15	37	$2,860
TE16	49	$3,281

AgeGroupID	Num_of_Incidents	Total_Incident_Costs
1	222	$14,758
2	314	$21,723

Task 3. The SQL commands to create all dimensions, fact tables and the table contents

```
/*
DROP TABLE typedim;
DROP TABLE monthdim;
DROP TABLE daycarecenterdim;
DROP TABLE teacherdim;
DROP TABLE agegroupdim;
DROP TABLE tempfact;
DROP TABLE incidentfact;
*/

--Type Dimension
CREATE TABLE typedim
   AS
      SELECT
         *
      FROM
         monchild.incidentstype;

SELECT
   *
FROM
   typedim;
```

	TYPEID	TYPE_DESCRIPTION
1	T1	Abrasion & Scrape
2	T2	Amputaion
3	T3	Asthma & respiratory
4	T4	Broken bone & fracture & dislocation
5	T5	Electric shock
6	T6	High temperature

--DayCare Center Dimension

```
CREATE TABLE daycarecenterdim
   AS
      SELECT
         *
      FROM
         monchild.daycare_center;

SELECT
   *
FROM
   daycarecenterdim;
```

	CENTERID	CENTER_CAPACITY	CENTER_POSTCODE	CENTER_PHONENUMBER	CENTER_OPENINGHOUR
1	CE1	200	3004	1800978429	9AM-5PM
2	CE2	200	3131	1300168881	9AM-5PM
3	CE3	200	3068	1800222543	9AM-5PM

--Teacher Dimension

```
CREATE TABLE teacherdim
   AS
      SELECT
         *
      FROM
         monchild.teacher;

SELECT
   *
FROM
   teacherdim;
```

	TEACH...	TEACHER_ROLE	TEACHER_NAME
1	TE1	Early childhood teacher	Arthur Lyu
2	TE2	Assistant educator	Kyler Hardin
3	TE3	Assistant educator	Simeon Vaughn
4	TE4	Assistant educator	Gabriela Sims
5	TE5	Early childhood teacher	Madelynn Obrien
6	TE6	Assistant educator	Kaydence House
7	TE7	Early childhood teacher	Juliette Flores
8	TE8	Early childhood teacher	Markus Hanna
9	TE9	Assistant educator	Nicole Powell
10	TE10	Assistant educator	Iliana Hurst
11	TE11	Assistant educator	Zion Bird
12	TE12	Assistant educator	Kyleigh Jensen
13	TE13	Assistant educator	Jazlyn Lee
14	TE14	Assistant educator	Charlee Coleman
15	TE15	Early childhood teacher	Donovan Hill
16	TE16	Early childhood teacher	Cade Stark

--Month Dimension

```
CREATE TABLE monthdim
   AS
      SELECT DISTINCT
         to_char(incident_date, 'MM')    AS monthid,
         to_char(incident_date, 'Month') AS month_desc
```

```
    FROM
        monchild.children_incidents;

SELECT
    *
FROM
    monthdim;
```

	MONTHID	MONTH_DESC
1	01	January
2	08	August
3	03	March
4	05	May
5	02	February
6	04	April
7	06	June
8	07	July

--Age Group Dimension

```
CREATE TABLE agegroupdim (
    agegroupid   NUMBER(2),
    agegroup_name VARCHAR2(50),
    agegroup_desc VARCHAR2(100)
);

INSERT INTO agegroupdim VALUES (
    1,
    'pre-kinder',
    'between 1 and 2 years old'
);

INSERT INTO agegroupdim VALUES (
    2,
    'kinder',
    'between 3 and 5 years old'
);

SELECT
    *
FROM
    agegroupdim;
```

	AGEGROUPID	AGEGROUP_NAME	AGEGROUP_DESC
1	1	pre-kinder	between 1 and 2 years old
2	2	kinder	between 3 and 5 years old

--TempFact Table

```
CREATE TABLE tempfact
    AS
        SELECT
            ci.typeid,
```

```
        to_char(ci.incident_date, 'MM') AS monthid,
        c.centerid,
        ci.teacherid,
        c.child_age,
        ci.incidentid,
        ci.incidents_cost
    FROM
        monchild.children_incidents ci,
        monchild.children           c
    WHERE
        ci.childrenid = c.childrenid;

ALTER TABLE tempfact ADD (
    agegroupid NUMBER(2)
);

UPDATE tempfact
SET
    agegroupid = 1
WHERE
    child_age BETWEEN 1 AND 2;

UPDATE tempfact
SET
    agegroupid = 2
WHERE
    child_age BETWEEN 3 AND 5;

SELECT
    *
FROM
    tempfact;
```

	TYPEID	MONTHID	CENTERID	TEACHERID	CHILD_AGE	INCIDENTID	INCIDENTS_COST	AGEGROUPID
1	T4	02	CE2	TE6	1	I21	71	1
2	T3	01	CE2	TE13	3	I22	134	2
3	T3	08	CE2	TE7	2	I23	14	1
4	T4	04	CE1	TE4	1	I24	122	1
5	T4	03	CE1	TE14	1	I25	52	1
6	T6	07	CE3	TE15	1	I26	106	1
7	T2	03	CE2	TE6	2	I27	146	1
8	T6	02	CE3	TE2	2	I28	192	1
9	T6	05	CE3	TE11	2	I29	182	1
10	T4	03	CE1	TE15	2	I30	151	1
11	T2	06	CE2	TE13	3	I31	111	2
12	T2	05	CE1	TE14	1	I32	69	1
13	T3	05	CE1	TE3	4	I33	172	2
14	T5	01	CE2	TE8	3	I34	22	2
15	T6	06	CE3	TE14	2	I35	119	1
16	T4	04	CE2	TE16	2	I36	153	1
17	T5	02	CE3	TE15	2	I37	27	1
18	T5	08	CE3	TE14	2	I38	193	1
19	T4	01	CE1	TE11	4	I39	100	2
20	T5	05	CE1	TE6	4	I40	100	2
21	T2	07	CE1	TE16	5	I41	173	2
22	T2	03	CE3	TE14	2	I42	187	1
23	T2	07	CE2	TE10	1	I43	60	1
24	T4	02	CE2	TE7	1	I44	31	1
25	T3	02	CE2	TE15	1	I45	153	1
26	T3	05	CE2	TE5	1	I46	197	1
27	T2	07	CE1	TE8	1	I47	108	1

(Note: This screenshot is part of the whole table)

--IncidentFact Table

```
CREATE TABLE incidentfact
   AS
      SELECT
         typeid,
         monthid,
         centerid,
         teacherid,
         agegroupid,
         COUNT(*)           AS num_of_incidents,
         SUM(incidents_cost) AS total_incident_costs
      FROM
         tempfact
      GROUP BY
         typeid,
         monthid,
         centerid,
         teacherid,
         agegroupid;

SELECT
   *
FROM
   incidentfact;
```

	TYPEID	MONTHID	CENTERID	TEACHERID	AGEGROUPID	NUM_OF_INCIDENTS	TOTAL_INCIDENT_COSTS
1	T4	03	CE1	TE14	1	1	52
2	T2	06	CE2	TE13	2	1	111
3	T2	07	CE2	TE10	1	1	60
4	T4	07	CE2	TE7	2	1	65
5	T2	08	CE2	TE13	2	1	69
6	T6	06	CE1	TE3	2	1	182
7	T3	08	CE1	TE13	1	1	189
8	T6	06	CE3	TE13	1	1	61
9	T5	01	CE2	TE4	2	1	196
10	T4	06	CE3	TE8	2	1	200
11	T5	06	CE1	TE4	1	1	127
12	T3	02	CE1	TE6	1	1	165
13	T4	01	CE1	TE6	2	1	139
14	T2	06	CE1	TE3	2	1	58
15	T5	03	CE1	TE15	1	1	115
16	T4	08	CE1	TE5	2	1	22
17	T6	01	CE1	TE16	2	1	55
18	T4	03	CE1	TE3	2	1	106
19	T3	01	CE2	TE13	1	1	75
20	T6	07	CE3	TE8	2	1	30
21	T5	06	CE1	TE6	2	1	22
22	T2	02	CE3	TE13	2	1	40
23	T4	07	CE1	TE7	2	1	174
24	T3	03	CE3	TE5	2	2	135
25	T5	05	CE2	TE16	2	1	155
26	T5	05	CE2	TE3	1	1	10
27	T3	05	CE1	TE14	2	1	165
28	T2	08	CE1	TE6	1	1	145
29	T4	06	CE1	TE6	2	1	193
30	T6	07	CE2	TE11	1	1	27
31	T3	07	CE3	TE3	2	1	17
32	T4	04	CE3	TE12	2	1	89
33	T4	07	CE2	TE16	1	1	29

(Note: This screenshot is part of the whole table)

Task 4. The SQL commands to answer the queries and the query results.

A. Show the total number of incidents and total incident costs by age group.

```
SELECT
   i.agegroupid,
   a.agegroup_name,
   SUM(i.num_of_incidents)     AS total_num_of_incidents,
   SUM(i.total_incident_costs) AS total_incident_costs
FROM
   incidentfact i,
   agegroupdim  a
WHERE
   i.agegroupid = a.agegroupid
GROUP BY
   i.agegroupid,
   a.agegroup_name;
```

	AGEGROUPID	AGEGROUP_NAME	TOTAL_NUM_OF_INCIDENTS	TOTAL_INCIDENT_COSTS
1	2	kinder	314	21723
2	1	pre-kinder	222	14758

B. Show the total number of incidents and total incident costs for the teachers whose roles are Early childhood teacher.

```
SELECT
   t.teacherid,
   t.teacher_role,
   SUM(i.num_of_incidents)     AS total_num_of_incidents,
   SUM(i.total_incident_costs) AS total_incident_costs
FROM
```

```
    incidentfact i,
    teacherdim   t
WHERE
      i.teacherid = t.teacherid
    AND t.teacher_role = 'Early childhood teacher'
GROUP BY
    t.teacherid,
    t.teacher_role;
```

	TEACHERID	TEACHER_ROLE	TOTAL_NUM_OF_INCIDENTS	TOTAL_INCIDENT_COSTS
1	TE8	Early childhood teacher	39	2465
2	TE15	Early childhood teacher	37	2860
3	TE16	Early childhood teacher	49	3281
4	TE1	Early childhood teacher	10	438
5	TE7	Early childhood teacher	44	2812
6	TE5	Early childhood teacher	50	2908

C. Show the total number of incidents and total incident costs by incident type in May.

```
SELECT
    i.typeid,
    t.type_description,
    m.month_desc              AS month,
    SUM(i.num_of_incidents)   AS total_num_of_incidents,
    SUM(i.total_incident_costs) AS total_incident_costs
FROM
    incidentfact i,
    typedim      t,
    monthdim     m
WHERE
      i.monthid = m.monthid
    AND i.typeid = t.typeid
```

```
    AND month_desc LIKE '%May%'
GROUP BY
    i.typeid,
    t.type_description,
    m.month_desc;
```

	TYPEID	TYPE_DESCRIPTION	MONTH	TOTAL_NUM_OF_INCIDENTS	TOTAL_INCIDENT_COSTS
1	T3	Asthma & respiratory	May	7	846
2	T5	Electric shock	May	8	678
3	T2	Amputaion	May	5	568
4	T1	Abrasion & Scrape	May	1	58
5	T4	Broken bone & fracture & dislocation	May	6	613
6	T6	High temperature	May	3	519

D. Show the total number of incidents and total incident costs by daycare center.

```
SELECT
    centerid,
    SUM(num_of_incidents)     AS total_num_of_incidents,
    SUM(total_incident_costs) AS total_incident_costs
FROM
    incidentfact
GROUP BY
    centerid;
```

	CENTERID	TOTAL_NUM_OF_INCIDENTS	TOTAL_INCIDENT_COSTS
1	CE1	218	16147
2	CE3	149	9256
3	CE2	169	11078

E. Show all information about the teacher who has the lowest number of incidents, including: teacherID, teacher_role, teacher_name, total_num_of_incidents, total_incident_cost

```
SELECT
    t.teacherid,
    t.teacher_role,
    t.teacher_name,
    SUM(i.num_of_incidents)     AS total_num_of_incidents,
```

```
    SUM(i.total_incident_costs) AS total_incident_costs
FROM
    incidentfact i,
    teacherdim   t
WHERE
    i.teacherid = t.teacherid
GROUP BY
    t.teacherid,
    t.teacher_role,
    t.teacher_name
HAVING
    SUM(i.num_of_incidents) = (
        SELECT
            MIN(total_num_of_incidents)
        FROM
            (
                SELECT
                    teacherid,
                    SUM(num_of_incidents) AS total_num_of_incidents
                FROM
                        incidentfact
                    NATURAL JOIN teacherdim
                GROUP BY
                    teacherid
            )
    );
```

	TEACHERID	TEACHER_ROLE	TEACHER_NAME	TOTAL_NUM_OF_INCIDENTS	TOTAL_INCIDENT_COSTS
1	TE1	Early childhood teacher	Arthur Lyu	10	438