# FIT3003 S2 2022 Take Home Test

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## 1 Case study

Pet9 is a pet services salon that offers professional, cage-free services to domestic pets, particularly dogs and cats. The staff at Pet9 are well-trained in different specialised services, including washing, pet grooming, tidy-up, and massages. Pet9 is well known for using environmentally friendly products in their services. Each visit is charged based on the service, pet type and pet size. Customers can choose either a junior, senior, or professional staff member to provide the services. An invoice is issued for each visit.

This document shows the procedure to process the business reports. We first designed a star schema illustrated in section 2, and then validate it shown in section 3. Then we implemented it using SQL developers depicted in section 4, and finally produce the report listed in section section 5. As such, we hope to fufill the requirement for getting the analytic insights.

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## 2 Task 1: Star Schema

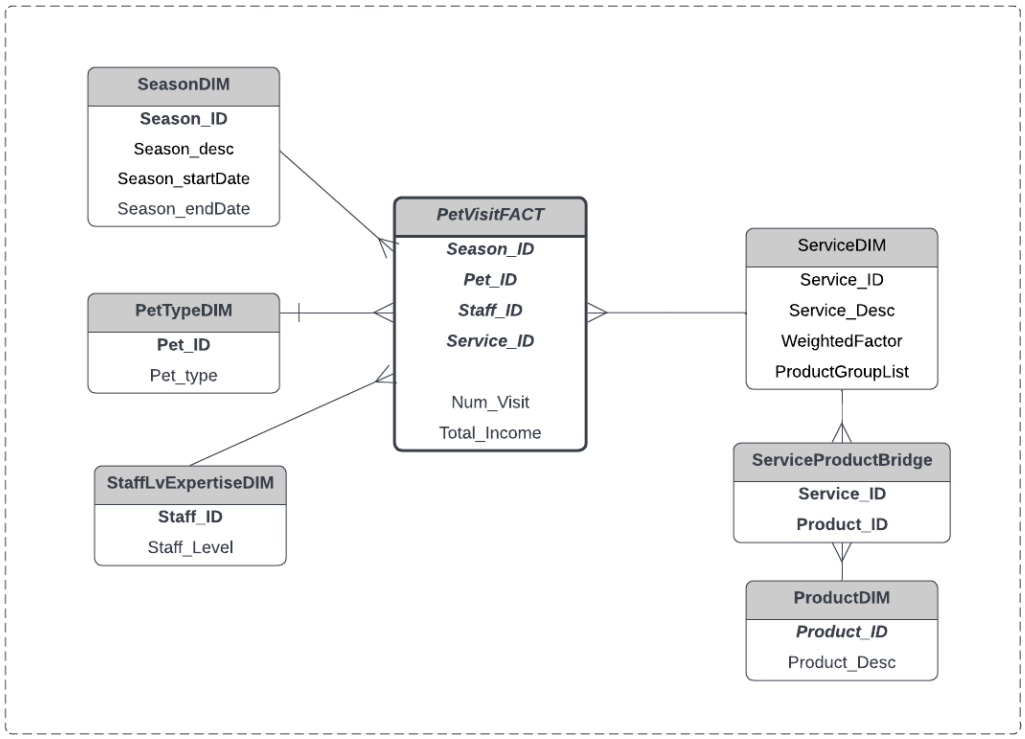


Figure 1: Star Schema for Pet9.

# 3 Task 2: Two-Column Table Methodology illustration

| Product ID | Product Description | Number of visit | Total Income |
|---|---|---|---|
| W0023 | Revitalising Bubble Wash | 212 | 21323 |
| W0001 | Nail Oil | 13232 | 3123123 |
| W0002 | Shiny Toothpaste | 123 | 1231231 |
| W0003 | Sweet Marjoram Oil | 41231 | 1324234 |

Figure 2: Two-column tables with the entity of product.

Note that it is not reasonable to have a number of visit for the entity of product, so we do not include it in the real report.

| Pet ID | Pet type | Number of visit | Total Income |
|---|---|---|---|
| P1 | Dog | 212 | 21323 |
| P5 | Cat | 122 | 12312 |
| P12 | Cat | 122 | 12312 |

Figure 3: Two-column tables with the entity of pet.

| Season | Season Descrption | Start Month | End Month | Number of visit | Total Income |
|---|---|---|---|---|---|
| S1 | Spring | Sep | Nov | 212 | 21323 |
| S2 | Summer | Dec | Feb | 13232 | 3123123 |
| S3 | Autumn | Mar | May | 123 | 1231231 |
| S4 | Winter | Jun | Aug | 41231 | 1324234 |

Figure 4: Two-column tables with the entity of season.

| Service ID | Service Description | Number of visit | Total Income |
|---|---|---|---|
| Serv1 | Relaxing Spa | 212 | 21323 |
| Serv2 | Soothing Spa | 13232 | 3123123 |
| Serv3 | Clean-up Spa | 123 | 1231231 |
| Serv4 | Ultimate Spa | 41231 | 1324234 |

Figure 5: Two-column tables with the entity of service.

| Staff ID | Level of expertise | Number of visit | Total Income |
|---|---|---|---|
| S213 | Senior | 212 | 21323 |
| S543 | Junior | 13232 | 3123123 |
| S123 | Professional | 123 | 1231231 |
| S432 | Professional | 41231 | 1324234 |

Figure 6: Two-column tables with the entity of staff.

# 4 Task 3: Tables of dimensions and fact

This section illustrates all the dimensions implemented using Oracle SQL developer. A screen of content would come along with the variables. For the code, please refer to the first sql file named “dataWarehouse.sql", or in the section 5.

| | SEASON_ID | SEASON_DESC | SEASON_STARTDATE | SEASON_ENDDATE |
|---|---|---|---|---|
| 1 | S1 | Spring | Sep | Nov |
| 2 | S2 | Summer | Dec | Feb |
| 3 | S3 | Autumn | Mar | May |
| 4 | S4 | Winter | Jun | Aug |

Figure 7: SeasonDim — The dimension of Season.

| | SERVICE_ID | SERVICE_DESC | WEIGHTEDFACTOR | PRODUCTGROUPLIST |
|---|---|---|---|---|
| 1 | S0001 | Basic Bubble Wash | .50 | W0004_W0009 |
| 2 | S0002 | Deluxe Bubble Wash | .33 | M0004_W0004_W0010 |
| 3 | S0003 | Premium Bubble Wash | .20 | C0010_C0011_M0004_W0003_W0008 |
| 4 | S0004 | Basic Tidy-Up | .20 | C0009_C0011_W0001_W0007_W0009 |
| 5 | S0005 | Relaxing Spa | .17 | C0002_C0004_M0002_W0002_W0007_W0010 |
| 6 | S0006 | Soothing Spa | .20 | C0003_C0009_M0001_W0001_W0007 |

Figure 8: ServiceDIM — The dimension of Service.

| | SERVICE_ID | PRODUCT_ID |
|---|---|---|
| 1 | S0001 | W0004 |
| 2 | S0001 | W0009 |
| 3 | S0002 | M0004 |
| 4 | S0002 | W0004 |
| 5 | S0002 | W0010 |
| 6 | S0003 | C0010 |

Figure 9: ServiceProductBridge — The bridge table between table Service and table Product

| | PET_TYPE | PET_ID |
|---|---|---|
| 1 | Cat | C0001 |
| 2 | Cat | C0002 |
| 3 | Dog | D0001 |
| 4 | Dog | D0002 |
| 5 | Dog | D0003 |
| 6 | Dog | D0004 |

Figure 10: PetTypeDIM — The dimension of Pet type

| | PRODUCT_ID | PRODUCT_DESC |
|---|---|---|
| 1 | W0001 | Soothing Bubble Wash |
| 2 | W0002 | Lavender Bubble Wash |
| 3 | W0003 | Volume Bubble Wash |
| 4 | W0004 | Odour-Away Bubble Wash |
| 5 | W0005 | Disinfectant Bubble Wash |
| 6 | W0006 | Revitalising Bubble Wash |

Figure 11: ProductDIM — The dimension of Product

| | STAFF_LEVEL | STAFF_ID |
|---|---|---|
| 1 | Junior | 10001 |
| 2 | Senior | 20001 |
| 3 | Junior | 10004 |
| 4 | Junior | 10005 |
| 5 | Profesional | 30002 |
| 6 | Senior | 20004 |

Figure 12: StaffLvExpertiseDIM — The dimension of Staff level of expertise

# 5 Task 4: Queries for business analysis

The following in this section are the reports as requested to the manager. For further code, please refer to the second sql file named "Queries.sql", or to this Figure 5.

| | SEASON_DESC | PET_TYPE | TOTAL_VISIT |
|---|---|---|---|
| 1 | Autumn | Cat | 16 |
| 2 | Spring | Cat | 12 |
| 3 | Summer | Cat | 18 |
| 4 | Winter | Cat | 11 |
| 5 | Autumn | Dog | 27 |
| 6 | Spring | Dog | 16 |
| 7 | Summer | Dog | 31 |
| 8 | Winter | Dog | 19 |

Figure 13: Query 1 — The number of visits by season and by pet types.

| | STAFF_LEVEL | TOTAL_VISIT |
|---|---|---|
| 1 | Senior | 48 |
| 2 | Profesional | 52 |
| 3 | Junior | 50 |

Figure 14: Query 2 — The number of visits handled by different levels of staff expertise.

| | PRODUCT_DESC | TOTAL_VISIT |
|---|---|---|
| 1 | Conditioner Intensive Care | 41 |
| 2 | Rose Oil | 19 |
| 3 | Allergy Spray | 30 |
| 4 | Revitalising Bubble Wash | 27 |
| 5 | Chamomile Oil | 14 |
| 6 | Conditioner Soft | 30 |
| 7 | Joint Massage Oil | 10 |
| 8 | Peppermint Paw Cream | 24 |
| 9 | Soothing Bubble Wash | 24 |
| 10 | Dry Nose Oil | 22 |
| 11 | Volume Bubble Wash | 12 |
| 12 | Hot Spot and Wound Spray | 9 |
| 13 | Ear Cleaner Spray | 43 |
| 14 | Lavender Bubble Wash | 11 |
| 15 | Shiny Toothpaste | 53 |
| 16 | Smell Good Cologne Spray | 22 |
| 17 | Sunscreen Balm | 9 |
| 18 | Odour-Away Bubble Wash | 25 |
| 19 | Eye Wash and Cleaner Spray | 44 |
| 20 | Conditioner Frizz Free | 42 |
| 21 | Lavender Oil | 11 |

Figure 15: Query 3 — The number of visits by different products.

| | SERVICE_DESC | PET_TYPE | TOTAL_INCOME |
|---|---|---|---|
| 1 | Basic Bubble Wash | Cat | 300 |
| 2 | Basic Bubble Wash | Dog | 360 |
| 3 | Basic Tidy-Up | Cat | 480 |
| 4 | Basic Tidy-Up | Dog | 320 |
| 5 | Clean-up Spa | Cat | 300 |
| 6 | Clean-up Spa | Dog | 600 |
| 7 | Deluxe Bubble Wash | Cat | 350 |
| 8 | Deluxe Bubble Wash | Dog | 630 |
| 9 | Flea Treatment | Cat | 900 |
| 10 | Flea Treatment | Dog | 1000 |
| 11 | Haircut | Cat | 200 |
| 12 | Haircut | Dog | 780 |
| 13 | Nail Trimming | Cat | 150 |
| 14 | Nail Trimming | Dog | 180 |
| 15 | Premium Bubble Wash | Cat | 560 |
| 16 | Premium Bubble Wash | Dog | 400 |
| 17 | Relaxing Spa | Cat | 320 |
| 18 | Relaxing Spa | Dog | 560 |
| 19 | Soothing Spa | Cat | 630 |
| 20 | Soothing Spa | Dog | 630 |
| 21 | Teeth Cleaning | Dog | 480 |

Figure 16: Query 4 — The total income by services, for different pet types.

| | PRODUCT_DESC | TOTAL_INCOME |
|---|---|---|
| 1 | Conditioner Intensive Care | 4260 |
| 2 | Rose Oil | 1900 |
| 3 | Allergy Spray | 2230 |
| 4 | Revitalising Bubble Wash | 2380 |
| 5 | Chamomile Oil | 1260 |
| 6 | Conditioner Soft | 2360 |
| 7 | Joint Massage Oil | 1400 |
| 8 | Peppermint Paw Cream | 2660 |
| 9 | Soothing Bubble Wash | 2060 |
| 10 | Dry Nose Oil | 1880 |
| 11 | Volume Bubble Wash | 960 |
| 12 | Hot Spot and Wound Spray | 900 |
| 13 | Ear Cleaner Spray | 4360 |
| 14 | Lavender Bubble Wash | 880 |
| 15 | Shiny Toothpaste | 4540 |
| 16 | Smell Good Cologne Spray | 2360 |
| 17 | Sunscreen Balm | 900 |
| 18 | Odour-Away Bubble Wash | 1640 |
| 19 | Eye Wash and Cleaner Spray | 3840 |
| 20 | Conditioner Frizz Free | 2840 |

Figure 17: Query 5 — The total income by different products.

The following are the code of the queries:

```
-- Q1: The number of visits by season and by pet types

SELECT s.season_desc,
       pd.pet_type,
       count(fact.total_visit) as TOTAL_VISIT
FROM PetVisitFACT fact,
     seasondim s,
     pettypedim pd
WHERE (s.season_id = fact.season_id)
      AND (pd.pet_id = fact.pet_id)
GROUP BY season_desc,
         pd.pet_type
ORDER BY pd.pet_type;

-- Q2: The number of visits handled by different levels of staff
    expertise
SELECT s.staff_level,
       count(total_visit) as TOTAL_VISIT
FROM PetVisitFACT f,
     staffdim s
WHERE s.staff_id = f.staff_id
GROUP BY s.staff_level;

-- Q3: The number of visits by different products
SELECT pd.product_desc,
       count(fact.total_visit) as TOTAL_VISIT
FROM ServiceDIM sd,
     serviceproductbridge spb,
     ProductDim pd,
     PetVisitFACT fact
WHERE (spb.product_id = pd.product_id)
      AND (sd.service_id = spb.service_id)
      AND (fact.service_id = sd.service_id)
GROUP BY pd.product_desc;

-- Q4: The total income by services, for different pet types
SELECT s.service_desc,
       p.pet_type,
       SUM(f.total_income) AS Total_income
FROM   pet9fact f,
       petdim p,
       servicedim s
WHERE  f.pet_id = p.pet_id
       AND f.service_id = s.service_id
GROUP  BY s.service_desc,
          p.pet_type
ORDER  BY s.service_desc;
```

```
-- Q5: The total income by different products.
SELECT pd.product_desc,
       sum(fact.TOTAL_INCOME) as TOTAL_INCOME
FROM ServiceDIM sd,
     serviceproductbridge spb,
     ProductDim pd,
     PetVisitFACT fact
WHERE (spb.product_id = pd.product_id)
      AND (sd.service_id = spb.service_id)
      AND (fact.service_id = sd.service_id)
GROUP BY pd.product_desc;
```

Here is the SQL command of creating data warehouse

```
-------------------------------- Dimension
--SeasonDIM
DROP TABLE seasondim CASCADE CONSTRAINTS purge;

CREATE TABLE seasondim
  (
     season_id        VARCHAR(20),
     season_desc      VARCHAR(20),
     season_startdate VARCHAR2(20),
     season_enddate   VARCHAR2(20)
  );

INSERT INTO seasondim
VALUES      ('S1',
             'Spring',
             'Sep',
             'Nov');

INSERT INTO seasondim
VALUES      ('S2',
             'Summer',
             'Dec',
             'Feb');

INSERT INTO seasondim
VALUES      ('S3',
             'Autumn',
             'Mar',
             'May');

INSERT INTO seasondim
VALUES      ('S4',
             'Winter',
             'Jun',
             'Aug');

--StaffLvExpertiseDIM
DROP TABLE stafflvexpertisedim CASCADE CONSTRAINTS purge;

CREATE TABLE stafflvexpertisedim AS
  (SELECT DISTINCT staff_level,
                   staff_id
   FROM   pet9.staff);

--PetTypeDIM
DROP TABLE pettypedim CASCADE CONSTRAINTS purge;
```

```
CREATE TABLE pettypedim AS
  SELECT pet_type,
         pet_id
  FROM   pet9.pet;

--ServiceProductBridge
DROP TABLE serviceproductbridge CASCADE CONSTRAINTS purge;

CREATE TABLE serviceproductbridge AS
  SELECT *
  FROM   pet9.product_use pu;

--ServiceDIM
DROP TABLE servicedim CASCADE CONSTRAINTS purge;

CREATE TABLE servicedim AS
  SELECT s.service_id,
         s.service_desc,
         To_char(1 / Count(s.service_id), 'fm99D00') AS
             WeightedFactor,
         Listagg (p.product_id, '_')
           within GROUP (ORDER BY p.product_id)      AS
              ProductGroupList
  FROM   pet9.service s,
         pet9.product p,
         pet9.product_use pu
  WHERE  ( pu.product_id = p.product_id )
         AND ( s.service_id = pu.service_id )
  GROUP  BY s.service_id,
            s.service_desc;

--ProductDim
DROP TABLE productdim CASCADE CONSTRAINTS purge;

CREATE TABLE productdim AS
  SELECT *
  FROM   pet9.product;

-------------------------------- TEMPFACT
DROP TABLE temp_fact CASCADE CONSTRAINTS purge;

CREATE TABLE temp_fact AS
  SELECT p.pet_id,
         v.visit_date,
         st.staff_id,
         s.service_id,
         v.price
  FROM   pet9.pet p,
         pet9.visit v,
```

```
         pet9.staff st,
         pet9.service s
  WHERE  v.pet_id = p.pet_id
         AND st.staff_id = v.staff_id
         AND s.service_id = v.service_id;

-- Adding one column of SeasonID to the tempFact
ALTER TABLE temp_fact
  ADD (season_id VARCHAR(20));

-- Season: Spring
UPDATE temp_fact
SET    season_id = 'S1'
WHERE  To_char(visit_date, 'MM') >= '09'
       AND To_char(visit_date, 'MM') <= '11';

-- Season: Summer
UPDATE temp_fact
SET    season_id = 'S2'
WHERE  To_char(visit_date, 'MM') = '12'
        OR To_char(visit_date, 'MM') <= '02';

-- Season: Autumn
UPDATE temp_fact
SET    season_id = 'S3'
WHERE  To_char(visit_date, 'MM') >= '03'
       AND To_char(visit_date, 'MM') <= '05';

-- Season: Winter
UPDATE temp_fact
SET    season_id = 'S4'
WHERE  To_char(visit_date, 'MM') >= '06'
       AND To_char(visit_date, 'MM') <= '08';

-- After assigning the Season column, drop the column of visit
    date
ALTER TABLE temp_fact
  DROP COLUMN visit_date;

DROP TABLE petvisitfact CASCADE CONSTRAINTS purge;

CREATE TABLE petvisitfact AS
  SELECT season_id,
         pet_id,
         staff_id,
         service_id,
         Count(*)    AS Total_visit,
         SUM (price) AS Total_income
  FROM   temp_fact
```

```
GROUP  BY season_id,
          service_id,
          staff_id,
          pet_id;
```