

# Information Technology Institute Data Management Track Data Warehouse Project (Intake 42/2021)

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# • Project DDLs:

```
----PASSENGER TABLE -----
CREATE TABLE PASSENGER (
PASSENGER_KEY NUMBER PRIMARY KEY,
PASSENGER_NATIONAL_KEY NUMBER,
PASSENGER_EMAIL VARCHAR2(30),
PASSENGER_FIRST_NAME VARCHAR2(30),
PASSENGER_LAST_NAME VARCHAR2(30),
PASSENGER_GENDER VARCHAR2(30),
PASSENGER_PHONE VARCHAR2(30),
PASSENGER_ADDRESS VARCHAR2(30)
-----FLIGHT_STATUS TABLE ------
CREATE TABLE FLIGHT_STATUS(
FLIGHT_STATUS_KEY NUMBER PRIMARY KEY,
FLIGHT_STATUS_TYPE VARCHAR2(25)
);
----ADD COLUMN TO PASSENGER-----
ALTER TABLE PASSENGER
ADD FLIGHT_STATUS_KEY NUMBER;
----- CONSTRAINT FLIGHT_STATUS------
ALTER TABLE PASSENGER
ADD CONSTRAINT CK_FLIGHT_STATUS
FOREIGN KEY (FLIGHT_STATUS_KEY)
REFERENCES FLIGHT_STATUS(FLIGHT_STATUS_KEY);
-----FLIGHT TABLE-----
CREATE TABLE FLIGHT(
FLIGHT_KEY NUMBER PRIMARY KEY,
FLIGHT_NUMBER NUMBER,
FLIGHT_DESCRIPTION VARCHAR2(50),
FLIGHT_SOURCE VARCHAR2(25),
```

```
FLIGHT_DESTINATION VARCHAR2(25),
FLIGHT_MILES NUMBER,
FLIGHT_DURATION NUMBER );
ALTER TABLE FLIGHT
MODIFY FLIGHT_NUMBER VARCHAR2(40);
----- PROMOTIONS TABLE -----
CREATE TABLE PROMOTIONS(
PROMOTION_KEY NUMBER PRIMARY KEY,
PROMOTION_CODE NUMBER,
PROMOTION_DESCRIPTION VARCHAR2(50));
-----AIRPORT TABLE -----
CREATE TABLE AIRPORT (
AIRPORT_KEY NUMBER PRIMARY KEY,
AIRPORT_CODE NUMBER,
AIRPORT NAME VARCHAR2(30),
AIRPORT_LOCATION VARCHAR2(30)
ALTER TABLE AIRPORT
MODIFY AIRPORT_CODE VARCHAR2(50);
-----RESERVATION_CHANNEL TABLE-----
CREATE TABLE RESERVATION_CHANNEL(
CHANNEL_KEY NUMBER PRIMARY KEY,
CHANNEL_CODE NUMBER,
CHANNEL_TYPE VARCHAR2(30)
);
-----FAREBASIS TABLE-----
CREATE TABLE FARE_BASIS(
```

```
FARE_BASIS_KEY NUMBER PRIMARY KEY,
FARE_BASIS_CODE NUMBER,
FARE_BASIS_DESCRIPTION VARCHAR2(30)
);
-----CLASS_TYPE TABLE----
CREATE TABLE CLASS_TYPE(
CLASS_KEY NUMBER PRIMARY KEY,
CLASS_CODE NUMBER,
CLASS_NAME VARCHAR2(30),
CLASS_START_DATE DATE,
CLASS_END_DATE DATE,
CLASS_INDICATOR VARCHAR2(30),
UPGRADE_REASEON VARCHAR2(30)
);
ALTER TABLE CLASS_TYPE
DROP COLUMN CLASS_START_DATE;
----MODIFICATIONS----
ALTER TABLE CLASS_TYPE
DROP COLUMN CLASS_END_DATE;
ALTER TABLE CLASS_TYPE
ADD CLASS_PURCHASED VARCHAR2(50);
ALTER TABLE CLASS_TYPE
ADD CLASS_FLOWN VARCHAR2(50);
ALTER TABLE CLASS_TYPE
DROP COLUMN FLIGHT_KEY;
```

```
-----FEEDBACK TABLE-----
CREATE TABLE FEEDBACK(
FEEDBACK_KEY NUMBER PRIMARY KEY,
FEEBACK_CODE NUMBER,
FEEDBACK_DESCRIPTION VARCHAR2(30),
FEEDBACK_TYPE NUMBER,
CONSTRAINT FK_FEEDBACK_TYPE
FOREIGN KEY(FEEDBACK_TYPE)
REFERENCES FEEDBACK_TYPES(FEEBACK_TYPE_KEY)
);
-----FEEDBACK_TYPE TABLE-----
CREATE TABLE FEEDBACK_TYPES(
FEEBACK_TYPE_KEY NUMBER PRIMARY KEY,
FEEDBACK_TYPE VARCHAR2(30)
);
-----DATE TABLE-----
CREATE TABLE DATE_TABLE(
DATE_KEY NUMBER PRIMARY KEY,
FULL DATE DATE
);
-----FLIGHT ACTIVITY FACT TABLE -----
CREATE TABLE FLIGHT_ACTIVITY_FACT(
FLIGHT_KEY NUMBER,
PASSENGER_KEY NUMBER,
AIRPORT_SOURCE_KEY NUMBER,
AIRPORT_DEST_KEY NUMBER,
```

SEGMENT\_SOURCE\_KEY NUMBER, SEGMENT\_DEST\_KEY NUMBER, SEGMENT\_DEPARTURE\_DATE\_KEY NUMBER, SEGMENT\_LANDING\_DATE\_KEY NUMBER, FLIGHT\_DEPARTURE\_DATE\_KEY NUMBER, FLIGHT\_LANDING\_DATE\_KEY NUMBER, FARE\_BASIS\_KEY NUMBER, RESERVATION\_CHANNEL\_KEY NUMBER, TICKET\_NUM NUMBER, TOTAL\_MILES NUMBER, SEGMENT\_DURATION NUMBER, TICKET\_FEES NUMBER, TOTAL\_PROFIT NUMBER, CONSTRAINT FK\_FLIGHT\_ACTIVITY FOREIGN KEY (FLIGHT\_KEY) REFERENCES FLIGHT(FLIGHT\_KEY),

CONSTRAINT FK\_PASSENGER\_KEY
FOREIGN KEY (PASSENGER\_KEY)
REFERENCES PASSENGER(PASSENGER\_KEY),

CONSTRAINT FK\_AIRPORT\_SOURCE\_KEY FOREIGN KEY (AIRPORT\_SOURCE\_KEY) REFERENCES AIRPORT(AIRPORT\_KEY),

CONSTRAINT FK\_AIRPORT\_DEST\_KEY
FOREIGN KEY (AIRPORT\_DEST\_KEY)
REFERENCES AIRPORT(AIRPORT\_KEY),

CONSTRAINT FK\_SEGMENT\_SOURCE\_KEY FOREIGN KEY (SEGMENT\_SOURCE\_KEY) REFERENCES AIRPORT(AIRPORT\_KEY),

CONSTRAINT FK\_SEGMENT\_DEST\_KEY
FOREIGN KEY (SEGMENT\_DEST\_KEY)
REFERENCES AIRPORT(AIRPORT\_KEY),

```
CONSTRAINT FK_SEGMENT_DEPARTURE_DATE_KEY
FOREIGN KEY (SEGMENT_DEPARTURE_DATE_KEY)
REFERENCES DATE_TABLE(DATE_KEY),
```

CONSTRAINT FK\_SEGMENT\_LANDING\_DATE\_KEY
FOREIGN KEY (SEGMENT\_LANDING\_DATE\_KEY)
REFERENCES DATE\_TABLE(DATE\_KEY),

```
CONSTRAINT FK_FLIGHT_DEPARTURE_DATE_KEY
FOREIGN KEY (FLIGHT_DEPARTURE_DATE_KEY)
REFERENCES DATE_TABLE(DATE_KEY),
```

CONSTRAINT FK\_FLIGHT\_LANDING\_DATE\_KEY FOREIGN KEY (FLIGHT\_LANDING\_DATE\_KEY) REFERENCES DATE\_TABLE(DATE\_KEY),

CONSTRAINT FK\_FARE\_BASIS\_KEY
FOREIGN KEY (FARE\_BASIS\_KEY)
REFERENCES FARE\_BASIS(FARE\_BASIS\_KEY),

CONSTRAINT FK\_RESERVATION\_CHANNEL\_KEY
FOREIGN KEY (RESERVATION\_CHANNEL\_KEY)
REFERENCES RESERVATION\_CHANNEL(CHANNEL\_KEY)

-----PROMOTION FACT TABLE -----

);

CREATE TABLE PROMOTION\_FACT(
FLIGHT\_KEY NUMBER,

```
PASSENGER_KEY NUMBER,
PROMOTION_KEY NUMBER,
CONSTRAINT FK_FLIGHT_ACTIVITY_PR
FOREIGN KEY (FLIGHT_KEY)
REFERENCES FLIGHT(FLIGHT_KEY),
CONSTRAINT FK_PASSENGER_KEY_PR
FOREIGN KEY (PASSENGER_KEY)
REFERENCES PASSENGER(PASSENGER_KEY),
CONSTRAINT FK_PROMOTION_KEY
FOREIGN KEY (PROMOTION_KEY)
REFERENCES PROMOTIONS(PROMOTION_KEY)
);
-----CLASS UPGRADE FACT TABLE -----
CREATE TABLE CLASS UPGRADE FACT(
PASSENGER KEY NUMBER,
CLASS_TYPE_KEY NUMBER,
TOTAL UPGRADES NUMBER,
TOTAL DOWNGRADES NUMBER,
CONSTRAINT FK_PASSENGER_KEY_TYPE_CLASS
FOREIGN KEY (PASSENGER KEY)
REFERENCES PASSENGER (PASSENGER KEY),
CONSTRAINT FK_CLASS_TYPE_KEY
FOREIGN KEY (CLASS TYPE KEY)
REFERENCES CLASS_TYPE(CLASS_KEY)
);
-----MODIFICATIONS----
```

```
ALTER TABLE CLASS_UPGRADE_FACT
ADD FLIGHT_KEY NUMBER;
ALTER TABLE CLASS_UPGRADE_FACT
ADD CONSTRAINT FK_CLASS_TYPE_FLIGHT FOREIGN KEY (FLIGHT_KEY)
REFERENCES FLIGHT(FLIGHT_KEY);
-----INTERACTIONS FACT TABLE -----
CREATE TABLE INTERACTIONS_FACT(
PASSENGER_KEY NUMBER,
FEEDBACK_KEY NUMBER,
DATE_KEY NUMBER,
TOTAL_INQUIRIES NUMBER,
CONSTRAINT FK_PASSENGER_KEY_INTERACTION
FOREIGN KEY (PASSENGER_KEY)
REFERENCES PASSENGER (PASSENGER KEY),
CONSTRAINT FK_FEEDBACK_KEY_INTERACTION
FOREIGN KEY (FEEDBACK_KEY)
REFERENCES FEEDBACK(FEEDBACK_KEY),
CONSTRAINT FK_DATE_KEY_INTERACTION
FOREIGN KEY (DATE_KEY)
```

REFERENCES DATE\_TABLE(DATE\_KEY)

);

• Decision Maker Questions as described in the case-study: (Queries)

### 1- What flights do the company's frequent flyers take?

### **OUERY**:

```
SELECT FA.PASSENGER_KEY, SUM(FA.TOTAL_MILES) AS TOTAL_MILES, P.PASSENGER_FIRST_NAME, F.FLIGHT_SOURCE, F.FLIGHT_DESTINATION FROM FLIGHT_ACTIVITY_FACT FA, PASSENGER P, FLIGHT F WHERE FA.PASSENGER_KEY = P.PASSENGER_KEY AND F.FLIGHT_KEY = FA.FLIGHT_KEY GROUP BY FA.PASSENGER_KEY, P.PASSENGER_FIRST_NAME, F.FLIGHT_SOURCE, F.FLIGHT_DESTINATION HAVING SUM(FA.TOTAL MILES) > 10000;
```

### 2-what fare basis do they pay?

**QUERY:** 

```
SELECT FA.PASSENGER_KEY, P.PASSENGER_FIRST_NAME, B.FARE_BASIS_CODE, B.FARE_BASIS_DESCRIPTION, SUM(FA.TOTAL_MILES) AS TOTAL_MILES FROM FLIGHT_ACTIVITY_FACT FA, PASSENGER P, FARE_BASIS B WHERE FA.PASSENGER_KEY = P.PASSENGER_KEY AND FA.FARE_BASIS_KEY = B.FARE_BASIS_KEY GROUP BY FA.PASSENGER_KEY, P.PASSENGER_FIRST_NAME, B.FARE_BASIS_CODE, B.FARE_BASIS_DESCRIPTION
```

### 3 – How often do they upgrade?

```
SELECT P.PASSENGER_KEY, COUNT(1) AS TOTAL_UPGRADE FROM PASSENGER P, CLASS_TYPE C, CLASS_UPGRADE_FACT T WHERE P.PASSENGER_KEY = T.PASSENGER_KEY AND C.CLASS_KEY = T.CLASS_TYPE_KEY AND C.CLASS_INDICATOR = 'Upgrade' GROUP BY P.PASSENGER_KEY;
```

### 4 – how often do they downgrade?

```
SELECT P.PASSENGER_KEY, COUNT(1) AS TOTAL_DOWNGRADE FROM PASSENGER P, CLASS_TYPE C, CLASS_UPGRADE_FACT T WHERE P.PASSENGER_KEY = T.PASSENGER_KEY AND C.CLASS_KEY = T.CLASS_TYPE_KEY AND C.CLASS_INDICATOR = 'Downgrade' GROUP BY P.PASSENGER_KEY;
```

## 5- how often do they don't make a change?

```
SELECT P.PASSENGER_KEY, COUNT(1) AS TOTAL_NO_CHANGES FROM PASSENGER P, CLASS_TYPE C, CLASS_UPGRADE_FACT T WHERE P.PASSENGER_KEY = T.PASSENGER_KEY AND C.CLASS_KEY = T.CLASS_TYPE_KEY AND C.CLASS_INDICATOR = 'No Class Change' GROUP BY P.PASSENGER_KEY;
```

### 6 - how do they earn and redeem their frequent flier miles?

```
INSERT INTO PASSENGER (PASSENGER KEY, PASSENGER FIRST NAME,
PASSENGER LAST NAME,
PASSENGER_EMAIL,FLIGHT_STATUS_KEY, PASSENGER_ADDRESS,
PASSENGER GENDER, PASSENGER NATIONAL KEY, PASSENGER PHONE)
SELECT P.PASSENGER KEY, P.PASSENGER FIRST NAME,
P.PASSENGER LAST NAME,
P.PASSENGER EMAIL, 2, P.PASSENGER ADDRESS, P.PASSENGER GENDER,
P.PASSENGER NATIONAL KEY, P.PASSENGER PHONE
FROM FLIGHT_ACTIVITY_FACT F, PASSENGER P, FLIGHT_STATUS S
WHERE F.PASSENGER KEY = P.PASSENGER KEY
AND P.FLIGHT STATUS KEY = S.FLIGHT STATUS KEY
GROUP BY P.PASSENGER_KEY, P.PASSENGER_FIRST_NAME,
P.PASSENGER LAST NAME,
P.PASSENGER_EMAIL, 2, P.PASSENGER_ADDRESS, P.PASSENGER_GENDER,
P.PASSENGER NATIONAL KEY, P.PASSENGER PHONE
HAVING SUM(TOTAL MILES) > 10000;
```

### 7- whether they respond to special fare promotions, and specify the promotion?

```
SELECT P.PASSENGER_FIRST_NAME, M.PROMOTION_DESCRIPTION
FROM PASSENGER P, PROMOTIONS M, PROMOTION_FACT MT
WHERE P.PASSENGER_KEY = MT.PASSENGER_KEY
AND M.PROMOTION_KEY = MT.PROMOTION_KEY
GROUP BY P.PASSENGER_FIRST_NAME, M.PROMOTION_DESCRIPTION;
```

8- what proportion of these frequent flyers have gold, platinum or titanium status?

SELECT F.FLIGHT\_STATUS\_TYPE, TRUNC(COUNT(P.FLIGHT\_STATUS\_KEY)/(SELECT COUNT(\*) FROM PASSENGER)\*100,2) AS percentage FROM PASSENGER P, FLIGHT\_STATUS F WHERE P.FLIGHT\_STATUS\_KEY = F.FLIGHT\_STATUS\_KEY GROUP BY F.FLIGHT\_STATUS\_TYPE;

### 9- What is the company's total profit?

SELECT SUM(TICKET\_FEES) AS TOTAL\_PROFIT FROM FLIGHT\_ACTIVITY\_FACT;

### 10- What's the average problem severity?

SELECT T.FEEDBACK\_TYPE, AVG(F.PROBLEM\_SEVERITY) AS PROBLEM\_SEVERITY FROM FEEDBACK F, FEEDBACK\_TYPES T, INTERACTIONS\_FACT N WHERE F.FEEDBACK\_TYPE = T.FEEBACK\_TYPE\_KEY AND N.FEEDBACK\_KEY = F.FEEDBACK\_KEY AND T.FEEBACK\_TYPE\_KEY= 2 GROUP BY T.FEEDBACK\_TYPE;

• Screenshots of Sample data:

















