CMPE 2400 Lab 1: CREATE
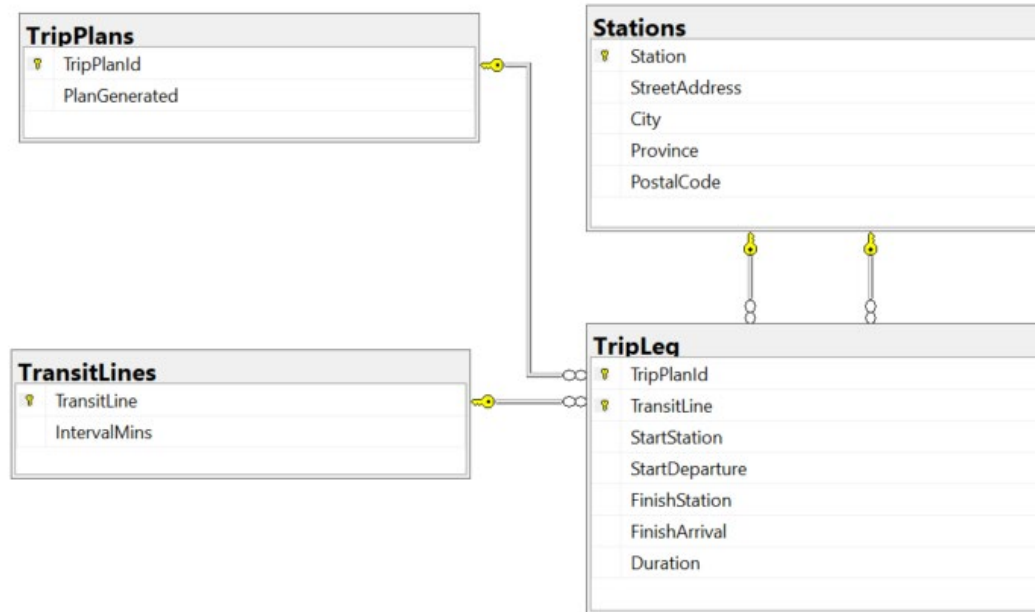
Create the following tables which will track trip plans on Edmonton's CAPITAL and METRO line trains.

Database Diagram

Checklist of required items:

☐ Conditional Drop Statements for all created items
☐ Script must be re-runnable without errors
☐ Database creation
☐ Database creation and drop statements commented out
☐ Appropriate USE statement
☐ Table creations
☐ PK creations
☐ FK creations
☐ Follow column constraints listed in the following table

Column Details

Table	Column(s)	Datatype/Constraints
Stations	Station	Text size 50, Primary Key
Stations	StreetAddress	Text size 30, mandatory
Stations	City	Text size 30, mandatory, defaults to **Edmonton**
Stations	Province	Fixed text size 2, mandatory, defaults to **AB**
Stations	PostalCode	Fixed text size 7, optional, must have pattern match checking for Canadian Postal Codes with space in the middle i.e. **T5T 4J2**
TripLeg	TripPlanId	Integer, mandatory, ***Part of PK Composite Key***
TripLeg	TransitLine	Text size 50, mandatory, ***Part of PK Composite Key***
TripLeg	StartStation, FinishStation	Text size 50, mandatory, FKs
TripLeg	StartDeparture, FinishArrival	Date and Time, mandatory
TripLeg	Duration	Trip Leg duration in minutes, calculated – not stored
TransitLines	TransitLine	Text size 50, PK
TransitLines	IntervalMins	Integer, mandatory, must be greater than 0
TripPlans	TripPlanId	Auto-generated integer, PK
TripPlans	PlanGenerated	Date and Time, mandatory, defaults to current date and time

Rubric: [80 marks]

MARKS	ITEM
5	Conditional Drop Statements for all items
5	Re-runnable script with no errors
5	Database Creation and commented out
4	USE statement
33	The attached script will be run to test your work. There are 33 checks. You receive 1 mark for each check that matches the expected output.
10	Verification of the data using the provided SQL statement (everything except the TripPlanId numbers should match exactly) – *no part marks*
18	Primary Keys and Foreign Keys (2 marks each)

Your script will not be modified during marking in the case there is an error. (If an early statement causes an error and no further statements run, you lose all those marks). It is up to you to test your script adequately before handing in.

Testing Script

Note that this script includes FICTIONAL DATA It also uses transactions. If the script throws an EXCEPTION, try running a standalone **ROLLBACK** to reset the transaction.

```sql
--Visual Inspection
--CONDITIONAL DROPS in correct order
--DROP/CREATE DB commented out
--USE STATEMENT

--TransitLines
ROLLBACK
BEGIN TRANSACTION
print 'Transit Lines: Expect 4 Fails'

insert into TransitLines (TransitLine)
values ('X')

insert into TransitLines (IntervalMins)
values (15)

insert into TransitLines(TransitLine, IntervalMins)
values ('cuezwqcwnrxtasdnzflwioesoyfupxcbovztcdsmodeupkhvqap', 15)

insert into TransitLines(TransitLine, IntervalMins)
values ('VALLEY', -5)

print 'Transit Lines: Expect 3 Success'

insert into TransitLines(TransitLine, IntervalMins)
values ('CAPITAL', 5)

insert into TransitLines(TransitLine, IntervalMins)
values ('METRO', 15)

insert into TransitLines(TransitLine, IntervalMins)
values ('WEST EDMONTON MALL - SHERWOOD PARK EXPRESS SERVICE', 30)

--***** STATIONS *******************
print 'Stations: Expect 7 Fails'

insert into Stations (Station)
values ('LAKE MINNEWAKA')

insert into Stations (StreetAddress)
values ('8770 170 ST NW')

insert into Stations (PostalCode)
values ('T5T 4J2')

insert into Stations (StreetAddress, PostalCode)
values ('8770 170 ST NW', 'T5T 4J2')

insert into Stations (Station, StreetAddress, PostalCode)
values ('WEST EDMONTON MALL / WEST JASPER PLACE TRANSIT CENTRE', '8770 170 ST NW', 'T5T
4J2')

insert into Stations (Station, StreetAddress, PostalCode)
```

```sql
    values ('WEST EDMONTON MALL / WEST JASPER PLACE TRANSIT CTR', '#1000 8770 170 STREET
    NORTHWEST', 'T5T 4J2')

    insert into Stations (Station, StreetAddress, PostalCode)
    values ('WEST EDMONTON MALL / WEST JASPER PLACE TRANSIT CTR', '8770 170 STREET
    NORTHWEST', 'T5T4J2')

    --*******************
    print 'Stations: Expect 6 Success'
    insert into Stations (Station, StreetAddress, PostalCode)
    values ('WEST EDMONTON MALL / WEST JASPER PLACE TRANSIT CTR', '8770 170 STREET
    NORTHWEST', 'T5T 4J2')

    insert into Stations (Station, StreetAddress, PostalCode)
    values ('NAIT STATION', '10600 PRINCESS ELIZABETH AVE', 'T5J 2R4')

    insert into Stations (Station, StreetAddress, PostalCode)
    values ('CHURCHILL STATION', 'CHURCHILL SQUARE NW', 'T5J 1X2')

    insert into Stations (Station, StreetAddress, PostalCode)
    values ('SOUTHGATE STATION', '4804 111 ST NW', 'T6K 3E4')

    insert into Stations (Station, StreetAddress, PostalCode)
    values ('BELVEDERE STATION', '12876 FORT RD NW', 'T5C 2R6')

    insert into Stations (Station, StreetAddress, City, Province, PostalCode)
    values ('VANCOUVER INTERNATIONAL AIRPORT - YVR DEPARTURES', '101 W. AIRPORT BLVD',
    'RICHMOND', 'BC', 'V6B 2R3')

    --**** TripPlans ****
    print 'TripPlans: Expect 1 Fail'
    insert into TripPlans (TripPlanId, PlanGenerated)
    values(101, GetDate())

    --********
    print 'TripPlans: Expect 2 Success'
    insert into TripPlans(PlanGenerated)
    values (GetDate())

    declare @TripPlan1 int = @@identity

    insert into TripPlans(PlanGenerated)
    values (GetDate())

    declare @TripPlan2 int = @@identity


    --********* TRIPLEG **************
    print 'TRIPLEG: Expect 7 Fails'
    insert into TripLeg (TripPlanId, TransitLine, StartStation, StartDeparture,
    FinishStation, FinishArrival)
    values (10100, 'CAPITAL', 'BELVEDERE STATION', GETDATE(), 'SOUTHGATE
    STATION',DATEADD(MINUTE,24,GETDATE()))

    insert into TripLeg (TransitLine, StartStation, StartDeparture, FinishStation,
    FinishArrival)
    values ('CAPITAL', 'BELVEDERE STATION', GETDATE(), 'SOUTHGATE
    STATION',DATEADD(MINUTE,24,GETDATE()))
```

```sql
insert into TripLeg (TripPlanId, StartStation, StartDeparture, FinishStation,
FinishArrival)
values (@TripPlan1, 'CAPITAL', GETDATE(), 'SOUTHGATE
STATION',DATEADD(MINUTE,24,GETDATE()))

insert into TripLeg (TripPlanId, TransitLine, StartStation, StartDeparture,
FinishStation, FinishArrival)
values (@TripPlan1, 'YYC', 'BELVEDERE STATION', GETDATE(), 'SOUTHGATE
STATION',DATEADD(MINUTE,24,GETDATE()))

insert into TripLeg (TripPlanId, TransitLine, StartStation, StartDeparture,
FinishStation)
values (@TripPlan1, 'CAPITAL', 'BELVEDERE STATION', GETDATE(), 'SOUTHGATE STATION')

insert into TripLeg (TripPlanId, TransitLine, StartStation, StartDeparture,
FinishStation, FinishArrival)
values (@TripPlan1, 'CAPITAL', 'SHAWNESSY STATION', GETDATE(), 'SOUTHGATE
STATION',DATEADD(MINUTE,24,GETDATE()))

insert into TripLeg (TripPlanId, TransitLine, StartStation, StartDeparture,
FinishStation, FinishArrival)
values (10100, 'CAPITAL', 'BELVEDERE STATION', GETDATE(), 'BRENTWOOD
STATION',DATEADD(MINUTE,24,GETDATE()))


--*********
PRINT 'TripLeg: Expect 3 Success'
insert into TripLeg (TripPlanId, TransitLine, StartStation, StartDeparture,
FinishStation, FinishArrival)
values (@TripPlan1, 'CAPITAL', 'BELVEDERE STATION', GETDATE(), 'CHURCHILL
STATION',DATEADD(MINUTE,15,GETDATE()))

insert into TripLeg (TripPlanId, TransitLine, StartStation, StartDeparture,
FinishStation, FinishArrival)
values (@TripPlan1, 'METRO', 'CHURCHILL STATION', DATEADD(MINUTE,20,GETDATE()), 'NAIT
STATION',DATEADD(MINUTE,35,GETDATE()))

insert into TripLeg (TripPlanId, TransitLine, StartStation, StartDeparture,
FinishStation, FinishArrival)
values (@TripPlan2, 'CAPITAL', 'SOUTHGATE STATION', GETDATE(), 'VANCOUVER INTERNATIONAL
AIRPORT - YVR DEPARTURES',DATEADD(DAY,1,GETDATE()))

--**** confirmation ***
select tp.TripPlanId, tp.PlanGenerated, f.Station 'From', leg.StartDeparture 'Departs',
      t.Station 'To', t.City, t.Province, leg.FinishArrival 'Arrives', leg.Duration,
tl.TransitLine, tl.IntervalMins
from TripLeg leg
join stations f
on leg.startstation = f.Station
join stations t
on leg.FinishStation = t.Station
join TripPlans tp
on tp.TripPlanId = leg.TripPlanId
join TransitLines tl
on tl.TransitLine = leg.TransitLine

ROLLBACK
```

```sql
--Review Created Keys
select 'Check Keys: Expect 9 Rows; 5 PK, 4 FK'

SELECT
     left(KU.table_name,30) as TABLENAME
    ,left(column_name,30) as 'Constraint Name', left(tc.constraint_type,30) as
'Constraint Type'
FROM INFORMATION_SCHEMA.TABLE_CONSTRAINTS AS TC

INNER JOIN INFORMATION_SCHEMA.KEY_COLUMN_USAGE AS KU
    ON TC.CONSTRAINT_NAME = KU.CONSTRAINT_NAME
    --AND KU.table_name='Riders'
WHERE ku.table_name != 'sysdiagrams'
ORDER BY
     KU.TABLE_NAME
    ,KU.ORDINAL_POSITION
```

Sample Output

```
Msg 3903, Level 16, State 1, Line 7
The ROLLBACK TRANSACTION request has no corresponding BEGIN TRANSACTION.
Transit Lines: Expect 4 Fails
Msg 515, Level 16, State 2, Line 11
Cannot insert the value NULL into column 'IntervalMins', table
'sdytiuk_ets.dbo.TransitLines'; column does not allow nulls. INSERT fails.
The statement has been terminated.
Msg 515, Level 16, State 2, Line 14
Cannot insert the value NULL into column 'TransitLine', table
'sdytiuk_ets.dbo.TransitLines'; column does not allow nulls. INSERT fails.
The statement has been terminated.
Msg 8152, Level 16, State 14, Line 17
String or binary data would be truncated.
The statement has been terminated.
Msg 547, Level 16, State 0, Line 20
The INSERT statement conflicted with the CHECK constraint
"CK__TransitLi__Inter__236943A5". The conflict occurred in database "sdytiuk_ets", table
"dbo.TransitLines", column 'IntervalMins'.
The statement has been terminated.
Transit Lines: Expect 3 Success

(1 row affected)

(1 row affected)

(1 row affected)
Stations: Expect 7 Fails
Msg 515, Level 16, State 2, Line 37
Cannot insert the value NULL into column 'PostalCode', table 'sdytiuk_ets.dbo.Stations';
column does not allow nulls. INSERT fails.
The statement has been terminated.
Msg 515, Level 16, State 2, Line 40
Cannot insert the value NULL into column 'PostalCode', table 'sdytiuk_ets.dbo.Stations';
column does not allow nulls. INSERT fails.
The statement has been terminated.
Msg 515, Level 16, State 2, Line 43
```

```
Cannot insert the value NULL into column 'Station', table 'sdytiuk_ets.dbo.Stations';
column does not allow nulls. INSERT fails.
The statement has been terminated.
Msg 515, Level 16, State 2, Line 46
Cannot insert the value NULL into column 'Station', table 'sdytiuk_ets.dbo.Stations';
column does not allow nulls. INSERT fails.
The statement has been terminated.
Msg 8152, Level 16, State 14, Line 49
String or binary data would be truncated.
The statement has been terminated.
Msg 8152, Level 16, State 14, Line 52
String or binary data would be truncated.
The statement has been terminated.
Msg 547, Level 16, State 0, Line 55
The INSERT statement conflicted with the CHECK constraint
"CK__Stations__Postal__2CF2ADDF". The conflict occurred in database "sdytiuk_ets", table
"dbo.Stations", column 'PostalCode'.
The statement has been terminated.
Stations: Expect 6 Success

(1 row affected)

(1 row affected)

(1 row affected)

(1 row affected)

(1 row affected)

(1 row affected)
TripPlans: Expect 1 Fail
Msg 544, Level 16, State 1, Line 80
Cannot insert explicit value for identity column in table 'TripPlans' when
IDENTITY_INSERT is set to OFF.
TripPlans: Expect 2 Success

(1 row affected)

(1 row affected)
TRIPLEG: Expect 7 Fails
Msg 547, Level 16, State 0, Line 98
The INSERT statement conflicted with the FOREIGN KEY constraint "fk_TripPlan". The
conflict occurred in database "sdytiuk_ets", table "dbo.TripPlans", column 'TripPlanId'.
The statement has been terminated.
Msg 515, Level 16, State 2, Line 101
Cannot insert the value NULL into column 'TripPlanId', table 'sdytiuk_ets.dbo.TripLeg';
column does not allow nulls. INSERT fails.
The statement has been terminated.
Msg 515, Level 16, State 2, Line 104
Cannot insert the value NULL into column 'TransitLine', table 'sdytiuk_ets.dbo.TripLeg';
column does not allow nulls. INSERT fails.
The statement has been terminated.
Msg 547, Level 16, State 0, Line 107
The INSERT statement conflicted with the FOREIGN KEY constraint "fk_TransitLine". The
conflict occurred in database "sdytiuk_ets", table "dbo.TransitLines", column
'TransitLine'.
The statement has been terminated.
```

```
Msg 515, Level 16, State 2, Line 110
Cannot insert the value NULL into column 'FinishArrival', table
'sdytiuk_ets.dbo.TripLeg'; column does not allow nulls. INSERT fails.
The statement has been terminated.
Msg 547, Level 16, State 0, Line 113
The INSERT statement conflicted with the FOREIGN KEY constraint "fk_StartStation". The
conflict occurred in database "sdytiuk_ets", table "dbo.Stations", column 'Station'.
The statement has been terminated.
Msg 547, Level 16, State 0, Line 116
The INSERT statement conflicted with the FOREIGN KEY constraint "fk_TripPlan". The
conflict occurred in database "sdytiuk_ets", table "dbo.TripPlans", column 'TripPlanId'.
The statement has been terminated.
TripLeg: Expect 3 Success

(1 row affected)

(1 row affected)

(1 row affected)
TripPlanId  PlanGenerated          From
Departs                To                                                    City
Province Arrives              Duration   TransitLine
IntervalMins
---------- ---------------------- ------------------------------------------------- --
-------------------- ------------------------------------------------------- ----------------
-------------- -------- -------------------- ----------- ----------------------------
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3          2022-01-18 11:51:16.393 BELVEDERE STATION
2022-01-18 11:51:16.397 CHURCHILL STATION                                    Edmonton
AB       2022-01-18 12:06:16.397 15          CAPITAL
5
3          2022-01-18 11:51:16.393 CHURCHILL STATION
2022-01-18 12:11:16.397 NAIT STATION                                         Edmonton
AB       2022-01-18 12:26:16.397 15          METRO
15
4          2022-01-18 11:51:16.393 SOUTHGATE STATION
2022-01-18 11:51:16.397 VANCOUVER INTERNATIONAL AIRPORT - YVR DEPARTURES    RICHMOND
BC       2022-01-19 11:51:16.397 1440         CAPITAL
5

(3 rows affected)


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Check Keys: Expect 9 Rows; 5 PK, 4 FK

(1 row affected)

TABLENAME                      Constraint Name                Constraint Type
------------------------------ ------------------------------ ---------------
Stations                       Station                        PRIMARY KEY
TransitLines                   TransitLine                    PRIMARY KEY
TripLeg                        FinishStation                  FOREIGN KEY
TripLeg                        StartStation                   FOREIGN KEY
TripLeg                        TransitLine                    FOREIGN KEY
TripLeg                        TripPlanId                     FOREIGN KEY
TripLeg                        TripPlanId                     PRIMARY KEY
TripLeg                        TransitLine                    PRIMARY KEY
```

TripPlans	TripPlanId	PRIMARY KEY

(9 rows affected)