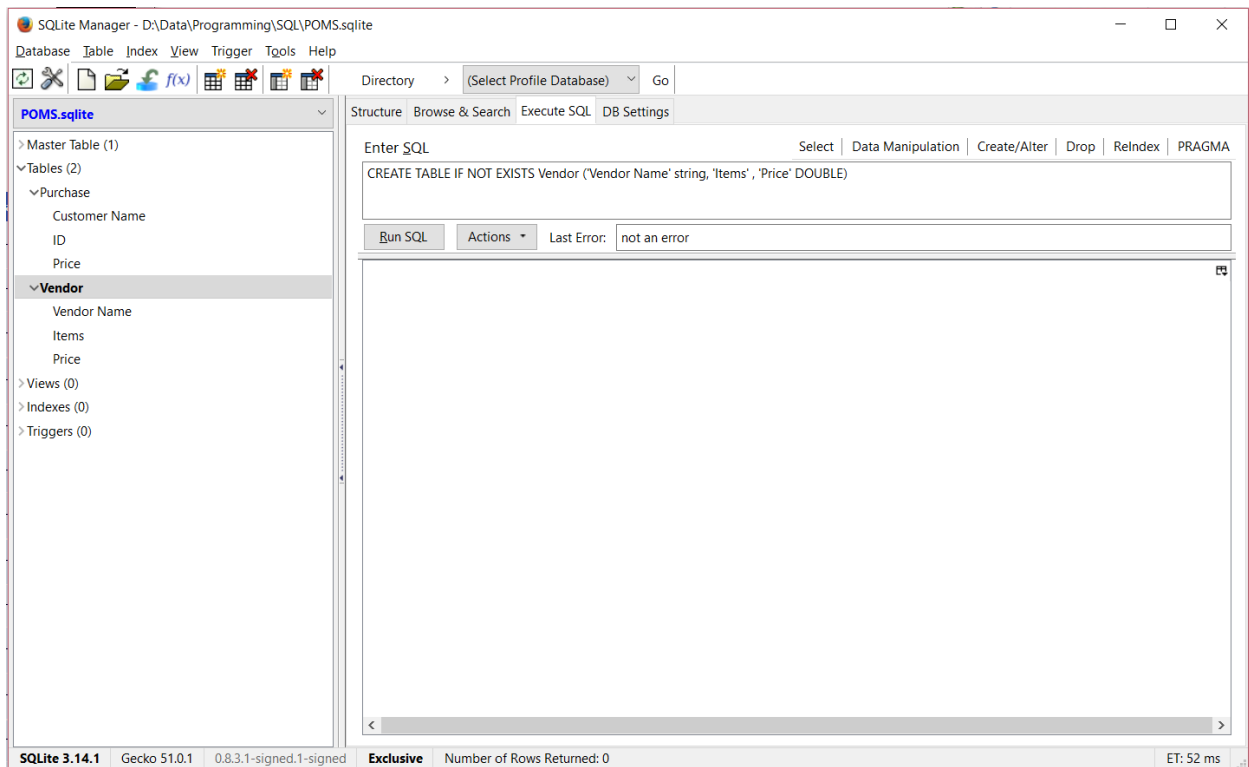
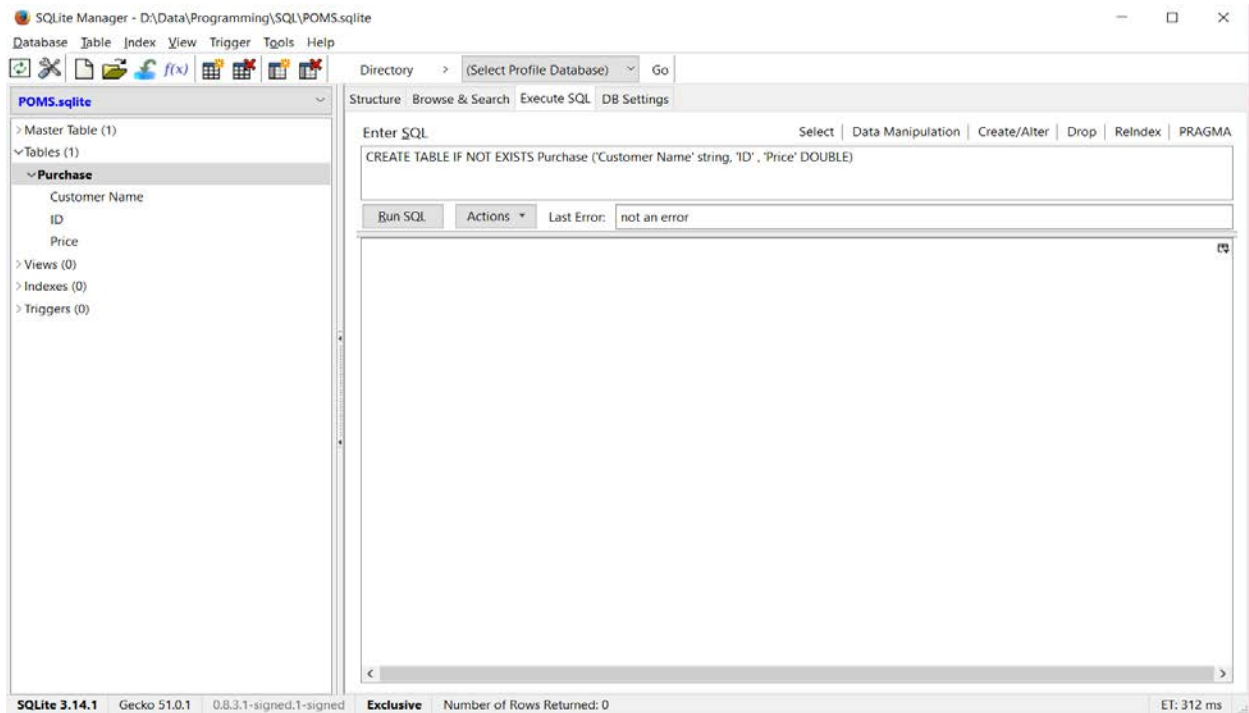
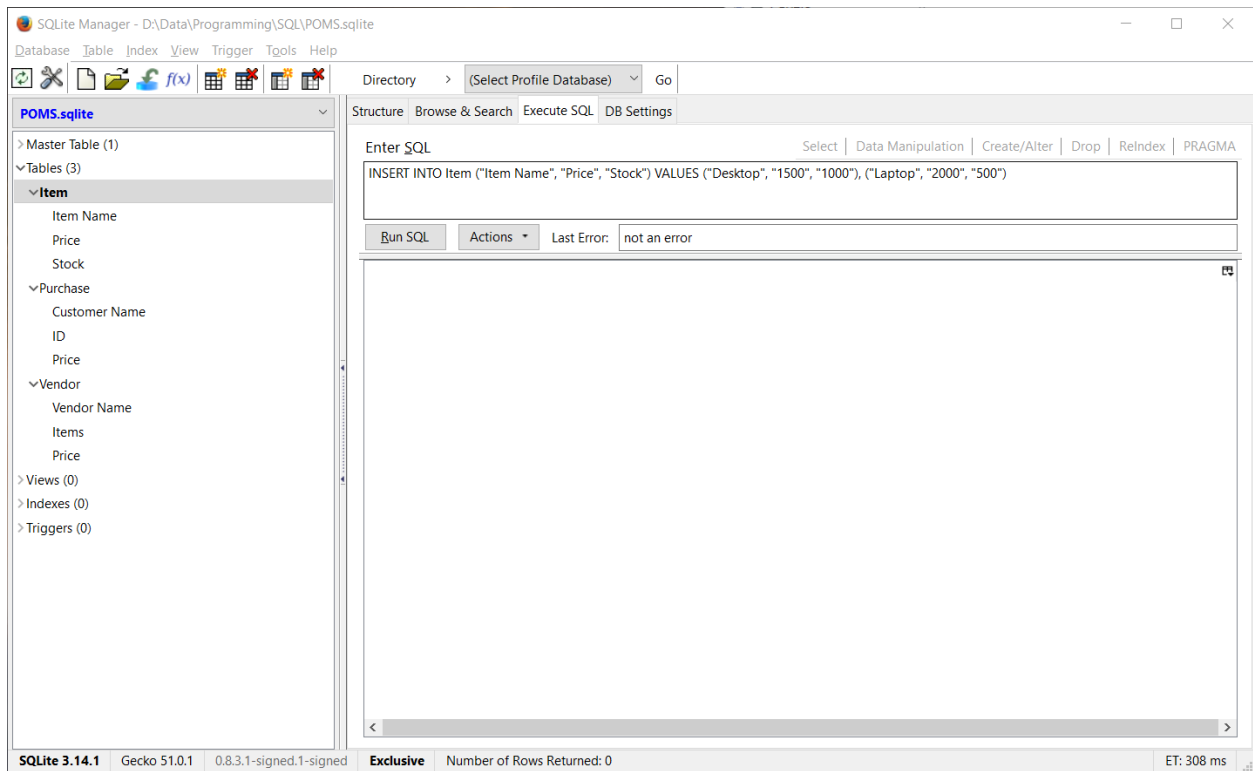
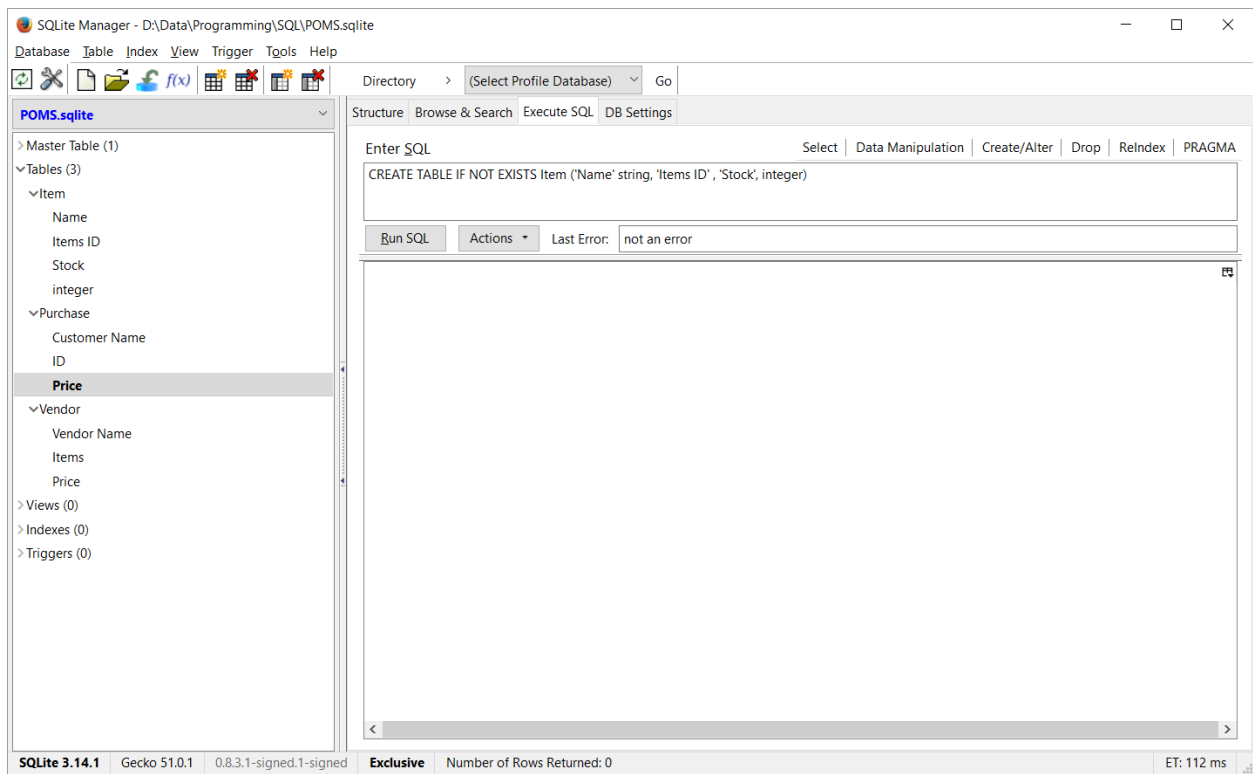


Software Engineering Platform CMPE 272, group 2:

Tin Tran, Sreedeeep Katragadeep, Shiva Kumar Padma, Satish Kumar Gollaprolu

SQL Lite Manager: Here we use a crude design, and some basic SQL queries to create, insert, and drop table





SQLite Manager - D:\Data\Programming\SQL\POMS.sqlite

Database Table Index View Trigger Tools Help

Directory > (Select Profile Database) Go

POMS.sqlite

> Master Table (1)

> Tables (3)

> Item

Item Name

Price

Stock

> Purchase

Customer Name

ID

Price

> Vendor

Vendor Name

Items

Price

> Views (0)

> Indexes (0)

> Triggers (0)

Structure Browse & Search Execute SQL DB Settings

Enter SQL

Select Data Manipulation Create/Alter Drop ReIndex PRAGMA

SELECT * from Item

Bun SQL Actions Last Error: not an error

Item Name	Price	Stock
Desktop	1500	1000
Laptop	2000	500

SQLite 3.14.1 Gecko 51.0.1 0.8.3.1-signed.1-signed Exclusive Number of Rows Returned: 2 ET: 1 ms

SQLite Manager - D:\Data\Programming\SQL\POMS.sqlite

Database Table Index View Trigger Tools Help

Directory > (Select Profile Database) Go

POMS.sqlite

> Master Table (1)

> Tables (3)

> Item

Item Name

Price

Stock

> Purchase

Customer Name

ID

Price

> Vendor

Vendor Name

Items

Price

> Views (0)

> Indexes (0)

> Triggers (0)

Structure Browse & Search Execute SQL DB Settings

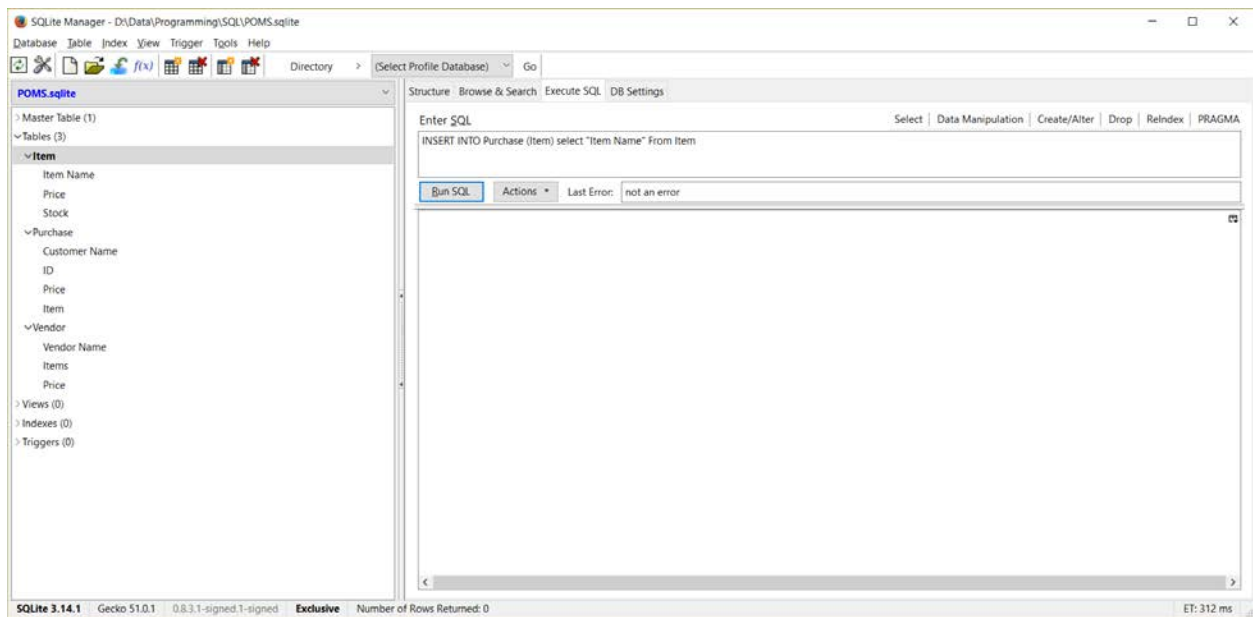
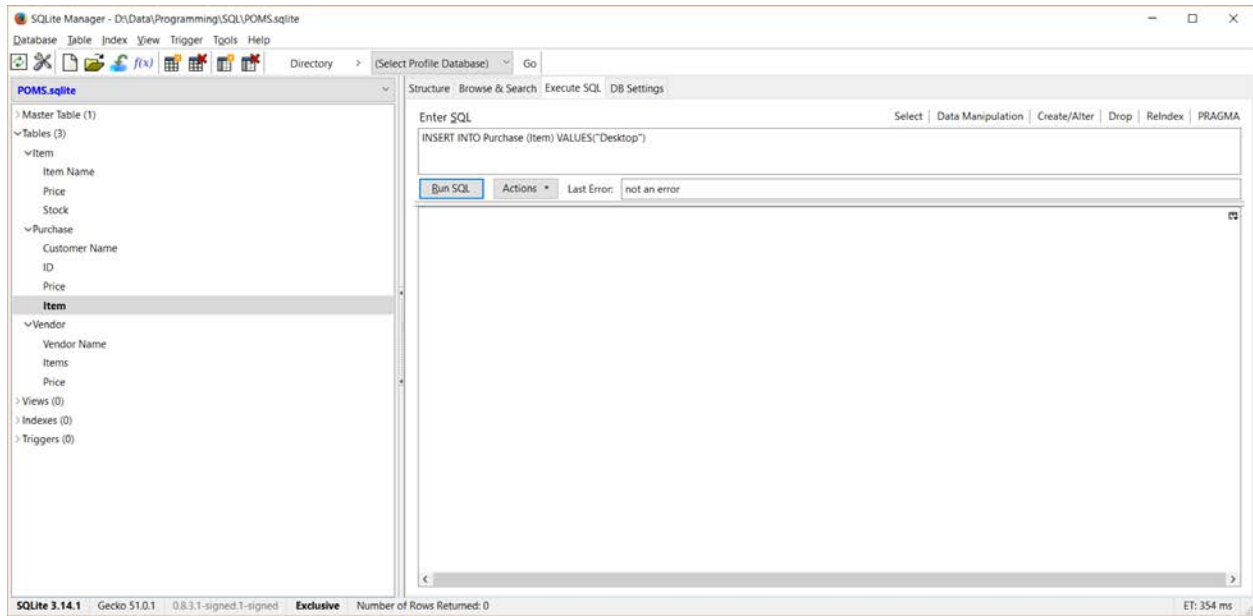
Enter SQL

Select Data Manipulation Create/Alter Drop ReIndex PRAGMA

ALTER TABLE Purchase ADD COLUMN Item

Bun SQL Actions Last Error: not an error

SQLite 3.14.1 Gecko 51.0.1 0.8.3.1-signed.1-signed Exclusive Number of Rows Returned: 0 ET: 353 ms



SQLite Manager - D:\Data\Programming\SQL\POMS.sqlite

Database Table Index View Trigger Tools Help

Directory > (Select Profile Database) Go

POMS.sqlite

> Master Table (1)

> Tables (3)

> Item

Item Name

Price

Stock

> Purchase

Customer Name

ID

Price

Item

> Vendor

Vendor Name

Items

Price

> Views (0)

> Indexes (0)

> Triggers (0)

Structure Browse & Search Execute SQL DB Settings

Enter SQL

Select * from Vendor

Select Data Manipulation Create/Alter Drop ReIndex PRAGMA

Bun SQL Actions Last Error: not an error

Vendor Name	Items	Price
Dell	Desktop	800
Lenovo	laptop	900

SQLite 3.14.1 Gecko 51.0.1 0.8.3.1-signed.1-signed Exclusive Number of Rows Returned: 2 ET: 1 ms

SQLite Manager - D:\Data\Programming\SQL\POMS.sqlite

Database Table Index View Trigger Tools Help

Directory > (Select Profile Database) Go

POMS.sqlite

> Master Table (1)

> Tables (3)

> Item

Item Name

Price

Stock

> Purchase

Customer Name

ID

Price

Item

> Vendor

Vendor Name

Items

Price

> Views (0)

> Indexes (0)

> Triggers (0)

Structure Browse & Search Execute SQL DB Settings

Enter SQL

Select * from Vendor where "Vendor Name" = "Dell"

Select Data Manipulation Create/Alter Drop ReIndex PRAGMA

Bun SQL Actions Last Error: not an error

Vendor Name	Items	Price
Dell	Desktop	800

SQLite 3.14.1 Gecko 51.0.1 0.8.3.1-signed.1-signed Exclusive Number of Rows Returned: 1 ET: 0 ms

DB2 Express C:

db2 => SELECT * from employee

EMPNO	FIRSTNAME	MIDINIT	LASTNAME	WORKDEPT	PHONENO	HIREDATE	JOB	EDLEVEL	SEX	BIRTHDATE	SALARY	BONUS	COMM
000010	CHRISTINE	I	HAAS	A00	3978	01/01/1995	PRES	18	F	08/24/1963	152750.00	1000.00	4220.00
000020	MICHAEL	L	THOMPSON	B01	3476	10/10/2003	MANAGER	18	M	02/02/1978	94250.00	800.00	3300.00
000030	SALLY	A	KWAN	C01	4738	04/05/2005	MANAGER	20	F	05/11/1971	98250.00	800.00	3060.00
000050	JOHN	B	GEYER	E01	6789	08/17/1979	MANAGER	16	M	09/15/1955	80175.00	800.00	3214.00
000060	IRVING	F	STERN	D11	6423	09/14/2003	MANAGER	16	M	07/07/1975	72250.00	500.00	2580.00
000070	EVA	D	PULASKI	D21	7831	09/30/2005	MANAGER	16	F	05/26/2003	96170.00	700.00	2893.00
000090	EILEEN	W	HENDERSON	E11	5498	08/15/2000	MANAGER	16	F	05/15/1971	89750.00	600.00	2380.00
000100	THEODORE	Q	SPENSER	E21	0972	06/19/2000	MANAGER	14	M	12/18/1980	86150.00	500.00	2092.00
000110	VINCENZO	G	LUCCHESSI	A00	3490	05/16/1988	SALESREP	19	M	11/05/1959	66500.00	900.00	3720.00
000120	SEAN	O'	CONNELL	A00	2167	12/05/1993	CLERK	14	M	10/18/1972	49250.00	600.00	2340.00
000130	DELORES	M	QUINTANA	C01	4578	07/28/2001	ANALYST	16	F	09/15/1955	73800.00	500.00	1904.00
000140	HEATHER	A	NICHOLLS	C01	1793	12/15/2006	ANALYST	18	F	01/19/1976	68420.00	600.00	2274.00
000150	BRUCE	A	ADAMSON	D11	4510	02/12/2002	DESIGNER	16	M	05/17/1977	55280.00	500.00	2022.00
000160	ELIZABETH	R	PIANKA	D11	3782	10/11/2006	DESIGNER	17	F	04/12/1980	62250.00	400.00	1780.00
000170	MASATOSHI	J	YOSHIMURA	D11	2890	09/15/1999	DESIGNER	16	M	01/05/1981	44680.00	500.00	1974.00
000180	MARILYN	S	SCOUTTEN	D11	1682	07/07/2003	DESIGNER	17	F	02/21/1979	51340.00	500.00	1707.00
000190	JAMES	H	WALKER	D11	2986	07/26/2004	DESIGNER	16	M	06/25/1982	50450.00	400.00	1636.00
000200	DAVID	B	BROWN	D11	4501	03/03/2002	DESIGNER	16	M	05/29/1971	57740.00	600.00	2217.00
000210	WILLIAM	T	JONES	D11	0942	04/11/1998	DESIGNER	17	M	02/23/2003	68270.00	400.00	1462.00
000220	JENNIFER	K	LUTZ	D11	0672	08/29/1998	DESIGNER	18	F	03/19/1978	49840.00	600.00	2387.00
000230	JAMES	J	JEFFERSON	D21	2094	11/21/1996	CLERK	14	M	05/30/1980	42180.00	400.00	1774.00
000240	SALVATORE	M	MARTINO	D21	3780	12/05/2004	CLERK	17	M	03/31/2002	48760.00	600.00	2301.00
000250	DANIEL	S	SMITH	D21	0961	10/30/1999	CLERK	15	M	11/12/1969	49180.00	400.00	1534.00
000260	SYBIL	P	JOHNSON	D21	8953	09/11/2005	CLERK	16	F	10/05/1976	47250.00	300.00	1380.00
000270	MARIA	L	PEREZ	D21	9001	09/30/2006	CLERK	15	F	05/26/2003	37380.00	500.00	2190.00
000280	ETHEL	R	SCHNEIDER	E11	8997	03/24/1997	OPERATOR	17	F	03/28/1976	36250.00	500.00	2100.00
000290	JOHN	R	PARKER	E11	4502	05/30/2006	OPERATOR	12	M	07/09/1985	35340.00	300.00	1227.00
000300	PHILLIP	X	SMITH	E11	2095	06/19/2002	OPERATOR	14	M	10/27/1976	37750.00	400.00	1420.00
000310	MAUDE	F	SETRIGHT	E11	3332	09/12/1994	OPERATOR	12	F	04/21/1961	35900.00	300.00	1272.00
000320	RAMLAL	V	MEHTA	E21	9900	07/07/1995	FIELDREP	16	M	08/11/1962	39950.00	400.00	1596.00
000330	MING	LEE	LEE	E21	2103	02/23/2006	FIELDREP	14	M	07/18/1971	45370.00	500.00	2030.00
000340	JASON	R	GOUNOT	E21	5698	05/05/1977	FIELDREP	16	M	05/17/1956	43840.00	500.00	1907.00
000010	DIAN	J	HEMMINGER	A00	3978	01/01/1995	SALESREP	18	F	08/14/1973	46500.00	1000.00	4220.00
000120	GREG	R	ORLANDO	A00	2167	05/05/2002	CLERK	14	M	10/18/1972	39250.00	600.00	2340.00
000140	KIM	N	NATZ	C01	1793	12/15/2006	ANALYST	18	F	01/19/1976	68420.00	600.00	2274.00
000170	KIYOSHI		YAMAMOTO	D11	2890	09/15/2005	DESIGNER	16	M	01/05/1981	64680.00	500.00	1974.00
000220	REDA	K	JOHN	D11	0672	08/29/2005	DESIGNER	18	F	03/19/1978	69840.00	600.00	2387.00
000240	ROBERT	M	MONTEVERDE	D21	3780	12/05/2004	CLERK	17	M	03/31/1984	37760.00	600.00	2301.00
000280	EILEEN	R	SCHWARTZ	E11	8997	03/24/1997	OPERATOR	17	F	03/28/1966	46250.00	500.00	2100.00
000310	MICHELLE	F	SPRINGER	E11	3332	09/12/1994	OPERATOR	12	F	04/21/1961	35900.00	300.00	1272.00
000330	HELENA		WONG	E21	2103	02/23/2006	FIELDREP	14	F	07/18/1971	35370.00	500.00	2030.00
000340	ROY	R	ALONZO	E21	5698	07/05/1997	FIELDREP	16	M	05/17/1956	31840.00	500.00	1907.00

42 record(s) selected.

db2 =>

```
db2 => select LASTNAME, SUM(salary) as total_salaries from employee where sex = 'F' group by LASTNAME
```

LASTNAME	TOTAL_SALARIES
HAAS	152750.00
HEMMINGER	46500.00
HENDERSON	89750.00
JOHN	69840.00
JOHNSON	47250.00
KWAN	98250.00
LUTZ	49840.00
NATZ	68420.00
NICHOLLS	68420.00
PEREZ	37380.00
PIANKA	62250.00
PULASKI	96170.00
QUINTANA	73800.00
SCHNEIDER	36250.00
SCHWARTZ	46250.00
SCOUTTEN	51340.00
SETRIGHT	35900.00
SPRINGER	35900.00
WONG	35370.00

19 record(s) selected.

```
db2 => select LASTNAME, SUM(salary) as total_salaries from employee where sex = 'M' group by LASTNAME
```

LASTNAME	TOTAL_SALARIES
ADAMSON	55280.00
ALONZO	31840.00
BROWN	57740.00
GEYER	80175.00
GOUNOT	43840.00
JEFFERSON	42180.00
JONES	68270.00
LEE	45370.00
LUCCHESI	66500.00
MARINO	48760.00
MEHTA	39950.00
MONTEVERDE	37760.00
O'CONNELL	49250.00
ORLANDO	39250.00
PARKER	35340.00
SMITH	86930.00
SPENSER	86150.00
STERN	72250.00
THOMPSON	94250.00
WALKER	50450.00
YAMAMOTO	64680.00
YOSHIMURA	44680.00

```
C:\Program Files\IBM\SQLLIB\BIN>db2 select LASTNAME, SUM(salary) as total_salaries from employee where sex = 'M' group by LASTNAME
```

LASTNAME	TOTAL_SALARIES
ADAMSON	55280.00
ALONZO	31840.00
BROWN	57740.00
GEYER	80175.00
GOUNOT	43840.00
JEFFERSON	42180.00
JONES	68270.00
LEE	45370.00
LUCCHESI	66500.00
MARINO	48760.00
MEHTA	39950.00
MONTEVERDE	37760.00
O'CONNELL	49250.00
ORLANDO	39250.00
PARKER	35340.00
SMITH	86930.00
SPENSER	86150.00
STERN	72250.00
THOMPSON	94250.00
WALKER	50450.00
YAMAMOTO	64680.00
YOSHIMURA	44680.00

22 record(s) selected.

Administrator: DB2 CLP - DB2COPY1

```
C:\Program Files\IBM\SQLLIB\BIN>db2 select LASTNAME,SUM(SALARY) as TOTAL_SALARIES from EMPLOYEE where sex = 'M' group by LASTNAME
SQL0217W The statement was not executed as only Explain information requests
are being processed.  SQLSTATE=01604
```

```
C:\Program Files\IBM\SQLLIB\BIN>db2exfmt -d sample -# 0 -w -1 -g TIC -n % -s %
DB2 Universal Database Version 11.1, 5622-044 (c) Copyright IBM Corp. 1991, 2015
Licensed Material - Program Property of IBM
IBM DATABASE 2 Explain Table Format Tool
```

```
Connecting to the Database.
Connect to Database Successful.
Enter outfile name. Default is to terminal ==> explain_plan.txt
Output is in explain_plan.txt.
Executing Connect Reset -- Connect Reset was Successful.
```

```
C:\Program Files\IBM\SQLLIB\BIN>
```


DB2 Universal Database Version 11.1, 5622-044 (c) Copyright IBM Corp. 1991, 2015

Licensed Material - Program Property of IBM

IBM DATABASE 2 Explain Table Format Tool

******* EXPLAIN INSTANCE *******

DB2_VERSION: 11.01.1

FORMATTED ON DB: SAMPLE

SOURCE_NAME: SQLC2026

SOURCE_SCHEMA: NULLID

SOURCE_VERSION:

EXPLAIN_TIME: 2017-02-22-15.04.22.083000

EXPLAIN_REQUESTER: SHIVA

Database Context:

Parallelism: None

CPU Speed: 1.417033e-007

Comm Speed: 0

Buffer Pool size: 250

Sort Heap size: 256

Database Heap size: 600

Lock List size: 4096

Maximum Lock List: 22

Average Applications: 1

Locks Available: 28835

Package Context:

SQL Type: Dynamic

Optimization Level: 5

Blocking: Block All Cursors

Isolation Level: Cursor Stability

----- STATEMENT 1 SECTION 201 -----

QUERYNO: 4

QUERYTAG: CLP

Statement Type: Select

Updatable: No

Deletable: No

Query Degree: 1

Original Statement:

select

LASTNAME,

SUM(SALARY) as TOTAL_SALARIES

from

EMPLOYEE

where

sex = 'M'

group by

LASTNAME

Optimized Statement:

```
SELECT
  Q3.LASTNAME AS "LASTNAME",
  Q3.$C1 AS "TOTAL_SALARIES"
FROM
  (SELECT
    Q2.LASTNAME,
    SUM(Q2.SALARY)
  FROM
    (SELECT
      Q1.LASTNAME,
      Q1.SALARY
    FROM
      SHIVA.EMPLOYEE AS Q1
    WHERE
      (Q1.SEX = 'M')
    ) AS Q2
  GROUP BY
    Q2.LASTNAME
  ) AS Q3
```

Access Plan:

Total Cost:	82.001
Query Degree:	1

Rows

RETURN

(1)

Cost

I/O

|

4

GRPBY

(2)

82.0007

12

|

4

TBSCAN

(3)

82.0005

12

|

4

SORT

(4)

82.0001

12

|

40

TBSCAN

(5)

81.9947

12

|

1000

TABLE: SHIVA

EMPLOYEE

Q1

Extended Diagnostic Information:

Diagnostic Identifier: 1

Diagnostic Details: EXP0020W Table has no statistics. The table "SHIVA"."EMPLOYEE" has not had runstats run on it. This may result in a sub-optimal access plan and poor performance.

Diagnostic Identifier: 2

Diagnostic Details: EXP0073W The following MQT or statistical view was not eligible because one or more data filtering predicates from the query could not be matched with the MQT: "SHIVA"."ADEFUSR".

Diagnostic Identifier: 3

Diagnostic Details: EXP0148W The following MQT or statistical view was considered in query matching: "SHIVA"."ADEFUSR".

Plan Details:

1) RETURN: (Return Result)

Cumulative Total Cost:	82.001
Cumulative CPU Cost:	2.40636e+006
Cumulative I/O Cost:	12
Cumulative Re-Total Cost:	0.308176
Cumulative Re-CPU Cost:	2.1748e+006
Cumulative Re-I/O Cost:	0
Cumulative First Row Cost:	82.0004
Estimated Bufferpool Buffers:	0

Arguments:

BLDLEVEL: (Build level)

DB2 v11.1.1010.160 : s1612051900

HEAPUSE : (Maximum Statement Heap Usage)

112 Pages

PLANID : (Access plan identifier)

bf4dea5da30e5f96

PREPTIME: (Statement prepare time)

61 milliseconds

SEMEVID : (Semantic environment identifier)

ca3a18197d36bb62

STMTHEAP: (Statement heap size)

8192

STMTID : (Normalized statement identifier)

fd3da65ff24a16e3

Input Streams:

5) From Operator #2

Estimated number of rows: 4
Number of columns: 2
Subquery predicate ID: Not Applicable

Column Names:

+Q4.TOTAL_SALARIES+Q4.LASTNAME

2) GRPBY : (Group By)

Cumulative Total Cost: 82.0007
Cumulative CPU Cost: 2.40414e+006
Cumulative I/O Cost: 12
Cumulative Re-Total Cost: 0.307861
Cumulative Re-CPU Cost: 2.17257e+006
Cumulative Re-I/O Cost: 0
Cumulative First Row Cost: 82.0004
Estimated Bufferpool Buffers: 0

Arguments:

AGGMODE : (Aggregation Mode)

FINAL

GROUPBYC: (Group By columns)

TRUE

GROUPBYN: (Number of Group By columns)

1

GROUPBYR: (Group By requirement)

1: Q2.LASTNAME

ONEFETCH: (One Fetch flag)

FALSE

Input Streams:

4) From Operator #3

Estimated number of rows: 4

Number of columns: 2

Subquery predicate ID: Not Applicable

Column Names:

+Q2.LASTNAME(A)+Q2.SALARY

Output Streams:

5) To Operator #1

Estimated number of rows: 4

Number of columns: 2

Subquery predicate ID: Not Applicable

Column Names:

+Q4.TOTAL_SALARIES+Q4.LASTNAME

3) TBSCAN: (Table Scan)

Cumulative Total Cost:	82.0005
Cumulative CPU Cost:	2.40282e+006
Cumulative I/O Cost:	12
Cumulative Re-Total Cost:	0.307674
Cumulative Re-CPU Cost:	2.17126e+006
Cumulative Re-I/O Cost:	0
Cumulative First Row Cost:	82.0003
Estimated Bufferpool Buffers:	0

Arguments:

MAXPAGES: (Maximum pages for prefetch)

ALL

PREFETCH: (Type of Prefetch)

NONE

SCANDIR : (Scan Direction)

FORWARD

SPEED : (Assumed speed of scan, in sharing structures)

SLOW

THROTTLE: (Scan may be throttled, for scan sharing)

FALSE

VISIBLE : (May be included in scan sharing structures)

FALSE

WRAPPING: (Scan may start anywhere and wrap)

FALSE

Input Streams:

3) From Operator #4

Estimated number of rows: 4
Number of columns: 2
Subquery predicate ID: Not Applicable

Column Names:

+Q2.LASTNAME(A)+Q2.SALARY

Output Streams:

4) To Operator #2

Estimated number of rows: 4
Number of columns: 2
Subquery predicate ID: Not Applicable

Column Names:

+Q2.LASTNAME(A)+Q2.SALARY

4) SORT : (Sort)

Cumulative Total Cost: 82.0001
Cumulative CPU Cost: 2.40029e+006

Cumulative I/O Cost: 12
Cumulative Re-Total Cost: 0.307315
Cumulative Re-CPU Cost: 2.16872e+006
Cumulative Re-I/O Cost: 0
Cumulative First Row Cost: 82.0001
Estimated Bufferpool Buffers: 12

Arguments:

AGGMODE : (Aggregation Mode)

PARTIAL

DUPLWARN: (Duplicates Warning flag)

FALSE

KEYS : (Key cardinality)

2

NUMROWS : (Estimated number of rows)

4

ROWWIDTH: (Estimated width of rows)

41.000000

SORTKEY : (Sort Key column)

1: Q2.LASTNAME(A)

TEMPSIZE: (Temporary Table Page Size)

8192

UNIQUE : (Uniqueness required flag)

FALSE

Input Streams:

2) From Operator #5

Estimated number of rows: 40
Number of columns: 2
Subquery predicate ID: Not Applicable

Column Names:

+Q2.SALARY+Q2.LASTNAME

Output Streams:

3) To Operator #3

Estimated number of rows: 4
Number of columns: 2
Subquery predicate ID: Not Applicable

Column Names:

+Q2.LASTNAME(A)+Q2.SALARY

5) TBSCAN: (Table Scan)

Cumulative Total Cost: 81.9947
Cumulative CPU Cost: 2.36232e+006
Cumulative I/O Cost: 12
Cumulative Re-Total Cost: 0.307315
Cumulative Re-CPU Cost: 2.16872e+006

Cumulative Re-I/O Cost: 0
Cumulative First Row Cost: 8.61685
Estimated Bufferpool Buffers: 12

Arguments:

CUR_COMM: (Currently Committed)

TRUE

LCKAVOID: (Lock Avoidance)

TRUE

MAXPAGES: (Maximum pages for prefetch)

ALL

PREFETCH: (Type of Prefetch)

NONE

ROWLOCK : (Row Lock intent)

SHARE (CS/RS)

SCANDIR : (Scan Direction)

FORWARD

SKIP_INS: (Skip Inserted Rows)

TRUE

SPEED : (Assumed speed of scan, in sharing structures)

FAST

TABLOCK : (Table Lock intent)

INTENT SHARE

TBISOLVL: (Table access Isolation Level)

CURSOR STABILITY

THROTTLE: (Scan may be throttled, for scan sharing)

TRUE

VISIBLE : (May be included in scan sharing structures)

TRUE

WRAPPING: (Scan may start anywhere and wrap)

TRUE

Predicates:

3) Sargable Predicate,

Comparison Operator: Equal (=)

Subquery Input Required: No

Filter Factor: 0.04

Predicate Text:

(Q1.SEX = 'M')

Input Streams:

1) From Object SHIVA.EMPLOYEE

Estimated number of rows: 1000

Number of columns: 4

Subquery predicate ID: Not Applicable

Column Names:

+Q1.\$RID\$+Q1.SALARY+Q1.LASTNAME+Q1.SEX

Output Streams:

2) To Operator #4

Estimated number of rows: 40
Number of columns: 2
Subquery predicate ID: Not Applicable

Column Names:

+Q2.SALARY+Q2.LASTNAME

Objects Used in Access Plan:

Schema: SHIVA

Name: ADEFUSR

Type: Materialized View (reference only)

Schema: SHIVA

Name: EMPLOYEE

Type: Table

Time of creation: 2017-02-22-13.53.50.939002

Last statistics update:

Number of columns: 14

Number of rows: 1000

Width of rows: 51

Number of buffer pool pages:	12
Number of data partitions:	1
Distinct row values:	No
Tablespace name:	USERSPACE1
Tablespace overhead:	6.725000
Tablespace transfer rate:	0.080000
Source for statistics:	Single Node
Prefetch page count:	32
Container extent page count:	32
Table overflow record count:	0
Table Active Blocks:	-1
Average Row Compression Ratio:	-1
Percentage Rows Compressed:	-1
Average Compressed Row Size:	-1

IBM BlueMix graph:

Here we use the sample graph data to construct the graph application.

We used a bash script to get the token, create a schema, and insert the data to graph application:

```
#!/bin/bash
IBM_GRAPH_DOCS="https://ibm-graph-docs.ng.bluemix.net/interactive-guide.html"
CREDS='
{
  "credentials": {
    "apiURL": "https://ibmgraph-alpha.ng.bluemix.net/7c6d8f8a-49fe-49a0-be2b-a8065b01bdd1/g",
    "username": "ba913251-28da-442d-bb05-7d7b5d11864d",
    "password": "b3b739e3-c104-40e0-a5b7-8ddefd5c2bba"
  }
},
'

USER=$(echo $CREDS | jq -r '.credentials.username')
PASS=$(echo $CREDS | jq -r '.credentials.password')
URL=$(echo $CREDS | jq -r '.credentials.apiURL' | sed -E 's/(.*)\/.*\/1/' ) # remove the graph name from the apiURL
alias curl='curl --max-time 60 --connect-timeout 5 --silent --show-error' # set some defaults for curl
TOKEN=$(curl "$URL/_session" -u "$USER:$PASS" | jq -r '["gds-token"]')
echo "Your session token is $TOKEN"

GRAPH="tingraphsample"
curl "$URL/_graphs/$GRAPH" -X POST -H "Authorization: gds-token $TOKEN" -d '' | jq '.'

SCHEMA='
{
  "propertyKeys": [
    {"name": "name", "dataType": "String", "cardinality": "SINGLE"},
    {"name": "verified", "dataType": "Boolean", "cardinality": "SINGLE"},
    {"name": "tweet", "dataType": "String", "cardinality": "SINGLE"},
    {"name": "sentiment", "dataType": "String", "cardinality": "SINGLE"},
    {"name": "tone", "dataType": "String", "cardinality": "SINGLE"},
    {"name": "hashtag", "dataType": "String", "cardinality": "SINGLE"},
    {"name": "numTimes", "dataType": "Integer", "cardinality": "SINGLE"},
    {"name": "time", "dataType": "String", "cardinality": "SINGLE"}
  ],
  "vertexLabels": [
    {"name": "person"},
    {"name": "hashtag"},
    {"name": "tweet"},
    {"name": "follow"}
  ],
  "edgeLabels": [
    {"name": "mentions", "multiplicity": "MULTI"},
    {"name": "hashes", "multiplicity": "MULTI"},
    {"name": "tweets", "multiplicity": "MULTI"},
    {"name": "favorites", "multiplicity": "MULTI"}
  ],
  "vertexIndexes": [
    {"name": "vByName", "propertyKeys": ["name"], "composite": true, "unique": true},
    {"name": "vByVerified", "propertyKeys": ["verified"], "composite": true, "unique": false},
    {"name": "vBySentiment", "propertyKeys": ["sentiment"], "composite": true, "unique": false},
    {"name": "vByTone", "propertyKeys": ["tone"], "composite": true, "unique": false},
    {"name": "vByTweet", "propertyKeys": ["tweet"], "composite": true, "unique": false},
    {"name": "vByHashtag", "propertyKeys": ["hashtag"], "composite": true, "unique": true},
    {"name": "vByNumTimes", "propertyKeys": ["numTimes"], "composite": true, "unique": false}
  ],
  "edgeIndexes": [
    {"name": "eByTime", "propertyKeys": ["time"], "composite": true, "unique": false}
  ]
}'

curl "$URL/$GRAPH/schema" -X POST -H "Authorization: gds-token $TOKEN" -H 'Content-Type: application/json' -d "$SCHEMA" | jq '.'
```



```

],
"vertexLabels": [
  {
    "name": "person"
  },
  {
    "name": "hashtag"
  },
  {
    "name": "tweet"
  },
  {
    "name": "follow"
  }
],
"edgeLabels": [
  {
    "name": "favorites",
    "directed": true,
    "multiplicity": "MULTI"
  },
  {
    "name": "mentions",
    "directed": true,
    "multiplicity": "MULTI"
  },
  {
    "name": "hashes",
    "directed": true,
    "multiplicity": "MULTI"
  },
  {
    "name": "tweets",
    "directed": true,
    "multiplicity": "MULTI"
  }
],
"vertexIndexes": [
  {
    "name": "vByName",
    "composite": true,
    "unique": true,
    "propertyKeys": [
      "name"
    ]
  },
  {
    "name": "vByVerified",
    "composite": true,
    "unique": true,
    "propertyKeys": [
      "verified"
    ]
  }
]
}

```

```

"vertexIndexes": [
  {
    "name": "vByName",
    "composite": true,
    "unique": true,
    "propertyKeys": [
      "name"
    ],
    "requiresReindex": false,
    "type": "vertex"
  },
  {
    "name": "vByVerified",
    "composite": true,
    "unique": false,
    "propertyKeys": [
      "verified"
    ],
    "requiresReindex": false,
    "type": "vertex"
  },
  {
    "name": "vBySentiment",
    "composite": true,
    "unique": false,
    "propertyKeys": [
      "sentiment"
    ],
    "requiresReindex": false,
    "type": "vertex"
  },
  {
    "name": "vByTone",
    "composite": true,
    "unique": false,
    "propertyKeys": [
      "tone"
    ],
    "requiresReindex": false,
    "type": "vertex"
  },
  {
    "name": "vByTweet",
    "composite": true,
    "unique": false,
    "propertyKeys": [
      "tweet"
    ],
    "requiresReindex": false,
    "type": "vertex"
  },
  {

```



```

    ],
    "edgeIndexes": [
      {
        "name": "eByTime",
        "composite": true,
        "unique": false,
        "propertyKeys": [
          "time"
        ],
        "requiresReindex": false,
        "type": "edge"
      }
    ],
    "meta": {}
  }
}
{
  "requestId": "08e0911a-0a7d-4702-bcb9-546399e7b8c0",
  "status": {
    "message": "",
    "code": 200,
    "attributes": {}
  },
  "result": {
    "data": [
      {
        "id": "5ju-3bk-cnp-6fc",
        "label": "favorites",
        "type": "edge",
        "inVLabel": "tweet",
        "outVLabel": "person",
        "inV": 8328,
        "outV": 4304,
        "properties": {
          "time": "5:22PM UTC"
        }
      }
    ],
    "meta": {}
  }
}

```

