SEPTEMBER 25, 2024

LAB HOMEWORK 2 B

CS 457 LAB B

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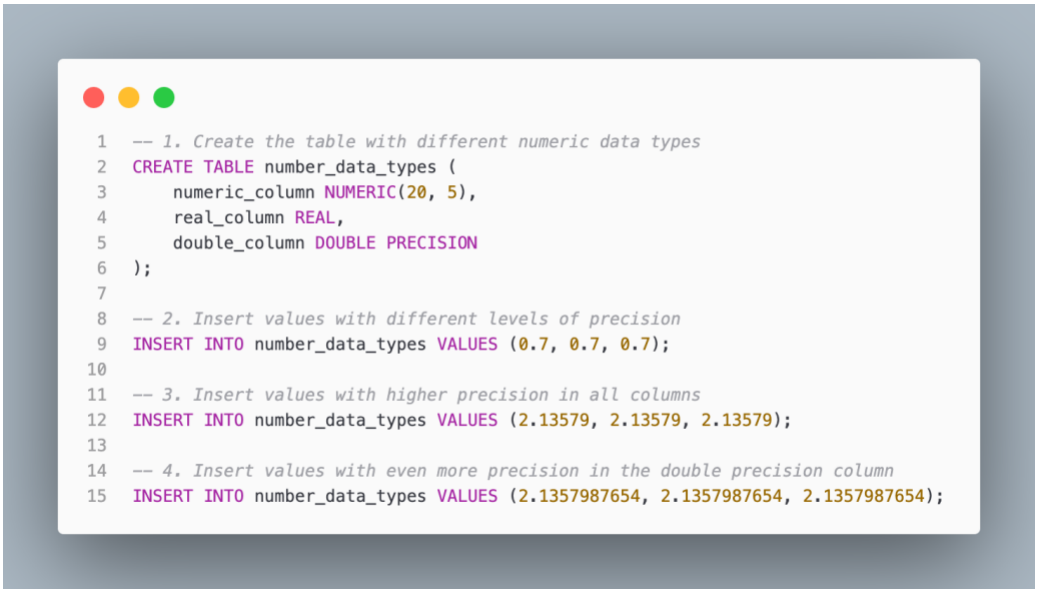
20281 - SFBU

1. Query 1 - 4



```sql
-- 1. Create the table with different numeric data types
CREATE TABLE number_data_types (
    numeric_column NUMERIC(20, 5),
    real_column REAL,
    double_column DOUBLE PRECISION
);

-- 2. Insert values with different levels of precision
INSERT INTO number_data_types VALUES (0.7, 0.7, 0.7);

-- 3. Insert values with higher precision in all columns
INSERT INTO number_data_types VALUES (2.13579, 2.13579, 2.13579);

-- 4. Insert values with even more precision in the double precision column
INSERT INTO number_data_types VALUES (2.1357987654, 2.1357987654, 2.1357987654);
```

2. QUERY – SELECT * FROM number_data_types;

numeric_column decimal(20,5)	real_column double	double_column double
0.70000	0.7	0.7
2.13579	2.13579	2.13579
2.13580	2.1357987654	2.1357987654

3. QUERY – SELECT numeric_column * 100000000 AS "fixed", real_column * 100000000 AS "float" FROM number_data_types WHERE numeric_column = 0.7;

fixed newdecimal	float double
70000000.00000	70000000

4. QUERY 7 - 13

```sql
-- 7. Create a table to store percent change data with department, spend_2014, and spend_2017
CREATE TABLE percent_change (
    department VARCHAR(20),
    spend_2014 NUMERIC(10, 2),
    spend_2017 NUMERIC(10, 2)
);

-- 8. Insert values into the percent_change table
INSERT INTO percent_change VALUES ('Building', 250000, 289000);

-- 9. Insert corrected values into the percent_change table
INSERT INTO percent_change VALUES ('Assessor', 178556, 179500);

-- 10. Insert values into the percent_change table
INSERT INTO percent_change VALUES ('Library', 87777, 90001);

-- 11. Insert values into the percent_change table
INSERT INTO percent_change VALUES ('Clerk', 451980, 650000);

-- 12. Insert values into the percent_change table
INSERT INTO percent_change VALUES ('Police', 250000, 223000);

-- 13. Insert values into the percent_change table
INSERT INTO percent_change VALUES ('Recreation', 199000, 195000);
```

5. QUERY – SELECT department, spend_2014, spend_2017, ROUND(((spend_2017 - spend_2014) / spend_2014) * 100, 1) AS "pct_change" FROM percent_change;

department varchar(20)	spend_2014 decimal(10,2)	spend_2017 decimal(10,2)	pct_change newdecimal
Building	250000.00	289000.00	15.6
Assessor	178556.00	179500.00	0.5
Library	87777.00	90001.00	2.5
Clerk	451980.00	650000.00	43.8
Police	250000.00	223000.00	-10.8
Recreation	199000.00	195000.00	-2.0

6. QUERY – SELECT SUM(spend_2014) AS "total_spend_2014", ROUND(AVG(spend_2017), 0) AS "approx_spend_2017" FROM percent_change;

total_spend_2014 newdecimal	approx_spend_2017 newdecimal
1417313.00	271084

7. QUERY 16 - 17

```
CREATE TABLE departments (
  dept_id INTEGER,
  dept VARCHAR(100),
  city VARCHAR(100),
  PRIMARY KEY (dept_id),
  UNIQUE (dept, city)
);

-- 17.

CREATE TABLE employees (
  emp_id INTEGER,
  first_name VARCHAR(100),
  last_name VARCHAR(100),
  salary INTEGER,
  dept_id INTEGER REFERENCES departments(dept_id),
  PRIMARY KEY (emp_id),
  UNIQUE (emp_id, dept_id)
);
```

8. Add data to the 4 tables. (15 ROWS)

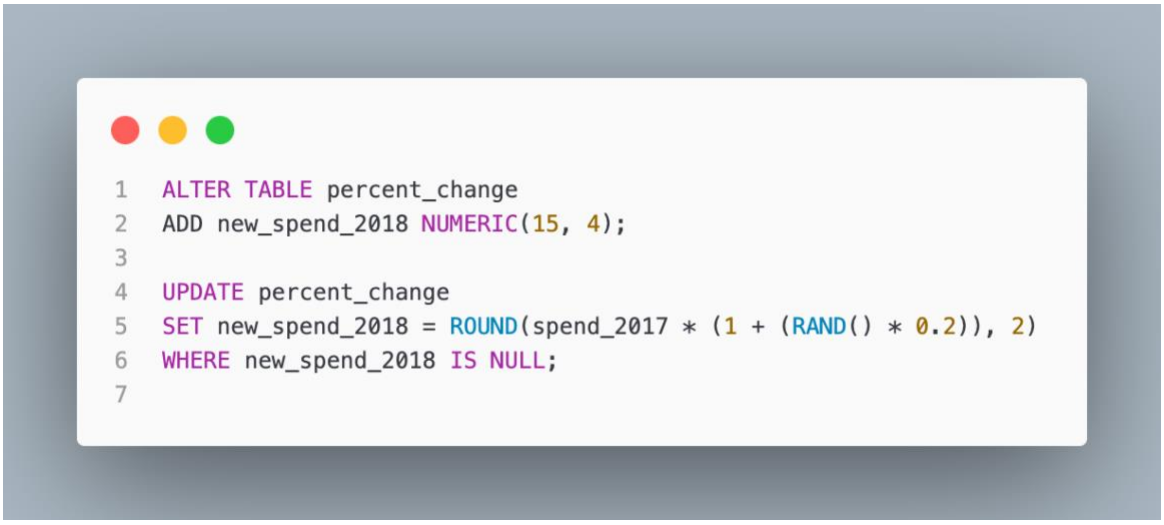
```sql
INSERT INTO departments (dept_id, dept, city) VALUES
(1, 'Tax', 'Atlanta'),
(2, 'IT', 'Boston'),
(3, 'HR', 'Chicago'),
(4, 'Finance', 'Dallas'),
(5, 'Legal', 'Houston'),
(6, 'Marketing', 'Miami'),
(7, 'Sales', 'New York'),
(8, 'Operations', 'San Francisco'),
(9, 'R&D', 'Seattle'),
(10, 'Customer Service', 'Los Angeles'),
(11, 'Logistics', 'Denver'),
(12, 'Procurement', 'Phoenix'),
(13, 'Compliance', 'Philadelphia'),
(14, 'Quality Assurance', 'San Diego'),
(15, 'Training', 'Orlando');

INSERT INTO employees (emp_id, first_name, last_name, salary, dept_id) VALUES
(1, 'Nancy', 'Jones', 62500, 1),
(2, 'Lee', 'Smith', 59300, 1),
(3, 'Soo', 'Nguyen', 83000, 2),
(4, 'Janet', 'King', 95000, 2),
(5, 'Carlos', 'Gonzalez', 72000, 3),
(6, 'Mia', 'Davis', 78000, 4),
(7, 'James', 'Johnson', 84000, 5),
(8, 'Ava', 'Brown', 67000, 6),
(9, 'Lucas', 'Miller', 75000, 7),
(10, 'Sophia', 'Wilson', 68000, 8),
(11, 'Olivia', 'Moore', 76000, 9),
(12, 'Ethan', 'Taylor', 81000, 10),
(13, 'Amelia', 'Anderson', 62000, 11),
(14, 'Benjamin', 'Thomas', 74000, 12),
(15, 'Charlotte', 'Jackson', 83000, 13);

INSERT INTO number_data_types (numeric_column, real_column, double_column) VALUES
(0.7, 0.7, 0.7),
(2.13579, 2.13579, 2.13579),
(2.1357987654, 2.1357987654, 2.1357987654),
(3.14, 3.14, 3.14),
(1.61803, 1.61803, 1.61803),
(2.71828, 2.71828, 2.71828),
(0.33333, 0.33333, 0.33333),
(4.6692, 4.6692, 4.6692),
(6.02214, 6.02214, 6.02214),
(9.81, 9.81, 9.81),
(0.001, 0.001, 0.001),
(100.12345, 100.12345, 100.12345),
(12345.67890, 12345.67890, 12345.67890),
(999.99999, 999.99999, 999.99999),
(0.00001, 0.00001, 0.00001);

INSERT INTO percent_change (department, spend_2014, spend_2017) VALUES
('Building', 250000, 289000),
('Assessor', 178556, 179500),
('Library', 87777, 90001),
('Clerk', 451980, 650000),
('Police', 250000, 223000),
('Recreation', 199000, 195000),
('Fire Dept', 300000, 320000),
('Public Works', 150000, 175000),
('Transport', 200000, 210000),
('Health', 100000, 115000),
('Education', 500000, 550000),
('Env Services', 120000, 125000),
('Housing Auth', 80000, 82000),
('Econ Dev', 60000, 65000),
('Parks', 75000, 80000);
```

9. Alter Table Command and create a floating point. With Un-equal Data using RANDOM.



```sql
ALTER TABLE percent_change
ADD new_spend_2018 NUMERIC(15, 4);

UPDATE percent_change
SET new_spend_2018 = ROUND(spend_2017 * (1 + (RAND() * 0.2)), 2)
WHERE new_spend_2018 IS NULL;

```

10. SELECT * FROM departments;

* dept_id int	dept varchar(100)	city varchar(100)
13	Compliance	Philadelphia
10	Customer Service	Los Angeles
4	Finance	Dallas
3	HR	Chicago
2	IT	Boston
5	Legal	Houston
11	Logistics	Denver
6	Marketing	Miami
8	Operations	San Francisco
12	Procurement	Phoenix
14	Quality Assurance	San Diego
9	R&D	Seattle
7	Sales	New York
1	Tax	Atlanta
15	Training	Orlando

11. SELECT * FROM employees;

* emp_id int	first_name varchar(100)	last_name varchar(100)	salary int	dept_id int
1	Nancy	Jones	62500	1
2	Lee	Smith	59300	1
3	Soo	Nguyen	83000	2
4	Janet	King	95000	2
5	Carlos	Gonzalez	72000	3
6	Mia	Davis	78000	4
7	James	Johnson	84000	5
8	Ava	Brown	67000	6
9	Lucas	Miller	75000	7
10	Sophia	Wilson	68000	8
11	Olivia	Moore	76000	9
12	Ethan	Taylor	81000	10
13	Amelia	Anderson	62000	11
14	Benjamin	Thomas	74000	12
15	Charlotte	Jackson	83000	13

12. SELECT * FROM number_data_types;

numeric_column decimal(20,5)	real_column double	double_column double
0.70000	0.7	0.7
2.13579	2.13579	2.13579
2.13580	2.1357987654	2.1357987654
3.14000	3.14	3.14
1.61803	1.61803	1.61803
2.71828	2.71828	2.71828
0.33333	0.33333	0.33333
4.66920	4.6692	4.6692
6.02214	6.02214	6.02214
9.81000	9.81	9.81
0.00100	0.001	0.001
100.12345	100.12345	100.12345
12345.67890	12345.6789	12345.6789
999.99999	999.99999	999.99999
0.00001	0.00001	0.00001

13. SELECT * FROM percent_change;

department varchar(20)	spend_2014 decimal(10,2)	spend_2017 decimal(10,2)	new_spend_2018 decimal(15,4)
Building	250000.00	289000.00	307090.6600
Assessor	178556.00	179500.00	190297.3000
Library	87777.00	90001.00	100168.2600
Clerk	451980.00	650000.00	769850.2200
Police	250000.00	223000.00	263813.4600
Recreation	199000.00	195000.00	226579.3100
Fire Dept	300000.00	320000.00	339413.1100
Public Works	150000.00	175000.00	178061.4900
Transport	200000.00	210000.00	232149.4000
Health	100000.00	115000.00	123611.6600
Education	500000.00	550000.00	581899.9900
Env Services	120000.00	125000.00	133168.4900
Housing Auth	80000.00	82000.00	94524.6500
Econ Dev	60000.00	65000.00	75897.5500
Parks	75000.00	80000.00	94404.3000