

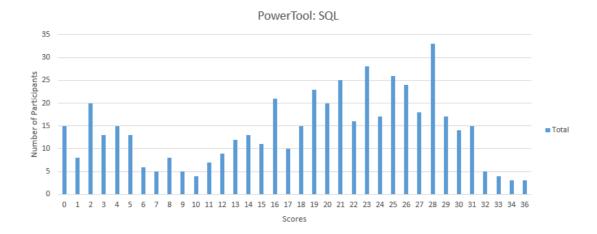
# 42 Questions on SQL for all aspiring Data Scientists

BUSINESS INTELLIGENCE CAREER **BUSINESS ANALYTICS** 

# Introduction

SQL is a universal tool in data science. Irrespective of which language you use as your main tool - you need to know SQL. There are no 2 ways about it. For most of the organisations, SQL is the way to store and retrieve structured data form underlying systems. So, if you are an aspiring data scientist or already a data science professional, having . expertise in SQL is a big boon.

To help our community test themselves on SQL, we designed a SQL skill test as part of DataFest 2017. More than 1500 people registered in the skill test and more than 500 people took the test. Below is the distribution of scores:



You can access the final scores here. Here are a few statistics about the distribution:

Mean Score: 18.41

Median Score: 20

Mode Score: 28

# **Questions & Solution**

- 1) Which of the following option(s) is/are correct?
  - 1. SQL is case insensitive
  - 2. SQL is a programming language

B) 2
C) Both 1 and 2
D) None of these
Solution: (A)
SQL is a querying language and it is not case sensitive.
2) What is true for a Null value in SQL?
1. Null +1 = Null
2. Null + 1 = 1
3. Null * 2 = Null
4. Null * 2 = 0
A) 1 and 3
B) 2 and 4
C) 1 and 4
D) 2 and 3
Solution: (A)
NULL represents a unknown value so adding anything to null value will give a null value in result.
3) Which of the following is not an aggregrate function in SQL?
A) MIN()
B) MAX()
C) DISTINCT()
D) COUNT()
Solution: (C)
All of the functions except DISTINCT function given in the question is an example of aggregate function.
4) Which of the following option is true for the below queries?
Query1: select 1 in (1,2,1,2); Query2: select 1 in (1,2);
A) Both queries will give different outputs.
B) Both queries will give same outputs.
C) Can't say
Solution: (B)

Both query will return the same output. 5) Which of the following cannot be a superkey in a relational schema with attributes A,B,C,D,E and primary key AD? A) ABCD B) A C D E C) ABCE D) A B D E Solution: (C) The attributes "A", "D" should be present in the super key. Option C doen't have "D" attribute so C would be the right answer. **Questions Context 6-7** You run the following Queries in the following order: Create a table "Me" using the below SQL query. Query1: Create table Me(name varchar(20), salary int); Next, you create a view based on "Me" table by using the following query. Query2: Create view me\_view as select name from me; Finally, you run the following query: Query3: Drop table Me; 6) Which of the following statements are true? 1. Query3 will give an error 2. Query3 will run smoothly 3. Query2 will give an error 4. Query2 will run smoothly A) 1 and 3 B) 1 and 4 C) 2 and 3

Query 2 is used for creating the view on table "Me" so it would run fine but if you run the Query3 it will generate the below error.

D) 2 and 4

Solution: (B)

ERROR: cannot drop table me because other objects depend on it
DETAIL: view me_view depends on table me
HINT: Use DROP CASCADE to drop the dependent objects too.
7) Now, you have changed the 'Query3' as below.
Query3: DROP TABLE Me CASCADE;
And, you also want to run below query on the same table.
Query4: select * from me_view;
Which of the following statements are true for such cases?
1. Query3 will give an error
2. Query3 will run smoothly
Query4 will give an error     Query4 will run smoothly
A) 1 and 3
B) 1and 4
C) 2 and 3
D) 2 and 4
Solution: (C)
If you drop the base table using cascade it will drop the base table as well as view table also so Query 3 will run fine but Query 4 will give an error.
8) Imagine, you have a column 'A' in table1 which is a primary key and it refers to column 'B' in table2.
Further, column 'A' has only three values (1,2,3). Which of the following options is / are correct?
1. Inserting a value 4 in column 'A' of table1 will result in an error
2. Inserting a value 4 in column 'B' of table2 will result in an error
3. Inserting a value 4 in column 'A' of table1 will be successful
4. Inserting a value 4 in column 'B' of table2 will be successful
A) 1 and 2
B) 2 and 3
C) 1 and 2
D) 3 and 4
Solution: (B)

You can insert any value except the duplicate values in column A in table 1 but you cannot insert the values other then 1,2 and 3 in columns B in table 2 due to foreign key integrity because it is referenced by the column A.

9) Consider a table T1 which contains 'Column A' in it. Column A is declared as a primary key. Which of

9) C	onsider a tabl	e T1 which	contains	'Column A	in it.	Column	A is d	declared	as a	primary	key.	Which	of
the f	ollowing is tr	ue for colui	mn "A" in <sup>-</sup>	Γ1?									

- 1. Column A can contain values [1,2,3,4,1]
- 2. Column A cannot contain values [1,2,3,4,1]
- 3. Column A can contain values [1,2,3,4,NULL]
- 4. Column A cannot contain values [1,2,3,4,NULL]
- A) 1 and 4
- B) 2 and 4
- C) 1 and 3
- D) 2 and 3

## Solution: (B)

A primary key column cannot contain duplicate and null values.

10) Imagine you have a table "T1" which has three columns "A", "B" and "C" where A is a "primary key".

Which of the following query will return number of rows present in the table T1

Query1: SELECT COUNT(A) FROM T1; Query2: SELECT COUNT(\*) FROM T1; Query3: SELECT COUNT(A,B) FROM T1;

- A) 1 and 2
- B) 2 and 3
- C) 1 and 3
- D) 1, 2 and 3

# Solution: (A)

Query1 and Query2 will return the same output.

# 11) Which of the following statement describes the capabilities of UPDATE command most appropriately?

- A) It can only modify one value of a single column
- B) It can update multiple values of a single column
- C) It can update one value of multiple columns
- D) It can update multiple values of multiple columns

# Solution: (D)

12) What is true about indexing in a database?
A) Search will be faster after you have indexed the database
B) Search will be slower after using indexing
C) Indexing has nothing to do with search
D) None of these

Solution: (A)

Option A is correct. Read more <u>here</u>.

13) Consider three tables T1, T2 and T3. Table T1, T2 and T3 have 10, 20, 30 number of records respectively. Further, there are some records which are common in all three tables.

You want to apply a cartesian product on these three tables. How many rows will be available in cartesian product of these tables?

- A) 6000
- B) More than 6000
- C) Less than 6000
- D) None of these

Solution: (A)

14) Tables A, B have three columns (namely: 'id', 'age', 'name') each. These tables have no null values and there are 100 records in each of the table.

Here are two queries based on these two tables A and B.

Query1: SELECT A.id FROM A WHERE A.age > ALL (SELECT B.age FROM B WHERE B.name = 'Ankit') Query2: SELECT A.id FROM A WHERE A.age > ANY (SELECT B.age FROM B WHERE B.name = 'Ankit')

## Which of the following statement is correct for the output of each query?

- A) The number of tuples in the output of Query 1 will be more than or equal to the output of Query 2
- B) The number of tuples in the output of Query 1 will be equal to the output of Query 2
- C) The number of tuples in the output Query 1 will be less than or equal to the output of Query 2
- D) Can't say

#### Solution: (C)

Answer C is correct because natural join always give either same or less number of rows if you compare it with cartesian product. To know more read from this <u>tutorial</u>.

# 15) What will be the output of the following query in PostgreSQL? Query 1: SELECT DATE\_PART('year', '2012-01-01'::date) - DATE\_PART('year', '2011-10-02'::date); A) ?column? 365 (1 row) B) ?column? 9 (1 row) C) ?column?

# (1 row)

Solution: (C)

?column? 305

(1 row)

D)

It will give the year differece in output so answer C is correct.

# 16) Imagine you are given the following table named "AV".

ID	NAME	DOB
1	ANKIT	1990-09-19
2	FAIZAN	1993-01-01
3	SUNIL	1985-11-02
4	SAURABH	1994-11-12
5	KUNAL	1983-11-12

# And you want to run the following queries Q1, Q2 and Q3 given below.

```
Q1: DROP TABLE AV; Q2: DELETE FROM AV; Q3: SELECT * FROM AV;
```

# Which sequence for the three queries will not result in an error?

- A) Q1 -> Q2 -> Q3
- B) Q2 -> Q1 -> Q3
- C) Q3 -> Q1 -> Q2
- D) Q2 -> Q3 -> Q1

# Solution: (D)

"DROP TABLE" will drop the table as well as it's reference. So, you can't access the table once you have dropped it. But in case of "DELETE TABLE" reference will not be droped so you can still access the table if you use "DELETE TABLE" command.

# 17) Imagine you are given the following table named "AV".

Ia	name	aob	saı
1	ANKIT	1990-09-19	200
2	FAIZAN	1993-01-01	300
3	SUNIL	1985-11-02	500
4	SAURABH	1994-11-12	350
5	KUNAL	1983-11-12	600

# You apply the following query Q1 on AV, which is given below:

Q1: SELECT \* FROM AV WHERE SAL BETWEEN 200 AND 500;

# What will be the output for query Q1?

A)

Id	Name	Dob	sal
1	ANKIT	1990-09-19	200
2	FAIZAN	1993-01-01	300
3	SUNIL	1985-11-02	500
4	SAURABH	1994-11-12	350

B)

ld	Name	Dob	sal
1	ANKIT	1990-09-19	200
2	FAIZAN	1993-01-01	300
4	SALIRARH	1994-11-12	350

C)

Id	Name	Dob	Sal
1	FAIZAN	1993-01-01	300
2	SUNIL	1985-11-02	500
3	SAURABH	1994-11-12	350

D)

Id	Name	Dob	Sal
1	FAIZAN	1993-01-01	300
2	SAURABH	1994-11-12	350

# Solution: (A)

The boundary salaries (200 and 500) will also be in the out so A is the right answer.

# 18) Imagine you are given the following table named "AV".

id	name	dob	sal
1	ANKIT	1990-09-19	200
2	FAIZAN	1993-01-01	300
3	SUNIL	1985-11-02	500
4	SAURABH	1994-11-12	350
5	KUNAL	1983-11-12	600

# What would be the output for the following query?

Query: SELECT ID, SUBSTRING(NAME, 2, 5) "sub\_name" FROM AV;

Id	Sub_name
1	NKI
2	AIZ
3	UNI
4	AUR
5	UNA
B)	
,	
Id	Sub_name
1	NKIT
2	AIZAN
3	UNIL
4	AURAB
5	UNAL
C)	
,	
Id	Sub_name
1	NK
2	Al
3	UN
4	AU
5	UN
Solution: (B)	

### **Question Context 19-21**

Assume you are given the two tables AV1 and AV2 which represent two different departments of AV.

#### **AV1 TABLE**

Id	name
1	ANKIT
2	FAIZAN
3	SUNIL
4	SAURABH
5	KUNAL

# **AV2 TABLE**

Id	name
1	DEEPAK
2	SWATI
3	DEEPIKA
4	PRANAV
5	KUNAL
5	SUNIL

- 19) Now, you want the names of all people who work in both the departments. Which of the following SQL query would you write?
- A) SELECT NAME FROM AV1 INTERSECT SELECT NAME FROM AV2;
- B) SELECT NAME FROM AV1 UNION SELECT NAME FROM AV2;
- C) SELECT NAME FROM AV1 DIFFERENCE SELECT NAME FROM AV2;
- D) None of these

INTERSECT would be used for such output. 20) What is the output for the below query? Query: SELECT NAME FROM AV1 EXCEPT SELECT NAME FROM AV2; A) name **FAIZAN** SAURABH ANKIT B) name **FAIZAN** SAURABH **ANKIT** SUNIL KUNAL C) ERROR D) None of these Solution: (A) This query will give the names in AV1 which are not present in AV2. 21) What will be the output of below query? Query: SELECT NAME FROM AV1 NATURAL JOIN AV2; A) name SUNIL KUNAL B) name SUNIL C) None of these Solution: (B) **Question Context 22-24** 

Suppose you are given the below table called A\_V.

Sal

100

dept

DS

Name

**ANKIT** 

Ιd

1

Solution: (A)

2	FAIZAN	200	DS
3	SUNIL	800	ALL
4	SAURABH		INTERN
5	KUNAL	1000	ALL

# 22) What is the output for the below query?

Query: SELECT DEPT, AVG(SAL) FROM A\_V GROUP BY DEPT, NAME;

A)

dept avg

DS 100.0000000000000000 ALL 800.000000000000000ALL 1000.00000000000000000 DS 200.00000000000000000

B)

dept avg

INTERN

DS 100.0000000000000000 ALL 800.0000000000000000 ALL 1000.00000000000000000 DS 200.0000000000000000

C) ERROR

D) None of these

Solution: (B)

# 23) What is the output for the below query?

Query: SELECT COALESCE(sal,2)+100 AS sal FROM A\_V;

A)

Sal

202

302 902

Null

1102

B)

Sal

200

300

900 102

1100

C)

Sal

202

302 902 102 1102

D) None of these

#### Solution: (B)

First replace null value will be replaced to 2 using COALESCE then 100 will be added.

# 24) What is the output for the below query?

```
Query: SELECT * FROM a_v WHERE name In ('Ankit', 'Faizan');
```

A)

ld	Name	Sal	Dept
1	ANKIT	100	DS
2	FAIZAN	200	DS

- B) Empty output
- C)Error
- D)None of these

# Solution: (B)

SQL is not case sensitive but when you search for something in a string column it becomes case sensitive. So output will have zero rows because 'Ankit' != 'ANKIT' and 'Faizan' != 'FAIZAN'.

25) You are given a string "AnalyticsVidhya". The string contains two unnecessary spaces — one at the start and another at the end. You find out the length of this string by applying the below queries.

```
Query1: SELECT length(rtrim(' AnalyticsVidhya ')); Query2: SELECT length(ltrim(' AnalyticsVidhya ')); Query3: SELECT length(rtrim(ltrim(' AnalyticsVidhya '))); Query4: SELECT length(ltrim(rtrim(' AnalyticsVidhya ')));
```

If op1, op2, op3, op4 are the output of the Query 1, 2, 3 and 4 respectively, what will be the correct relation between these four queries?

- 1. op1 = op2 and op3 = op4
- 2. op1 < op3 and op2 > op4
- 3. op1 > op3 and op2< op4
- 4. op1 > op3 and op2 > op4
- A) 1 or 2
- B) 2
- C) 3
- D) 1 and 4

#### Solution: (D)

Option D is correct. For more information read from this tutorial.

#### **Questions Context 26-27**

# Below you are given a table "split".

uk	id
ANKIT-001-1000-AV1	1
SUNIL-002-2000-AV2	2
FAIZY-007-3000-AV1	3

# 26) Now, you want to apply a query on this.

```
Query: SELECT SPLIT_PART(uk, '-', 0) FROM SPLIT;
```

# What is the output for the above query?

```
A)
```

### split\_part

ANKIT SUNIL

FAIZY

B)

# split\_part

001

002

007

C)

#### split\_part

1000

2000

3000

D)

# split\_part

AV1

AV2 AV1

E) Error

# Solution:(E)

The query will give the below error.

ERROR: field position must be greater than zero

# 27) In the above table "split", you want to replace some characters using "translate" command. Which of the following will be the output of the following query?

```
Query: SELECT TRANSLATE(UK, 'ANK', '123') FROM SPLIT;
```

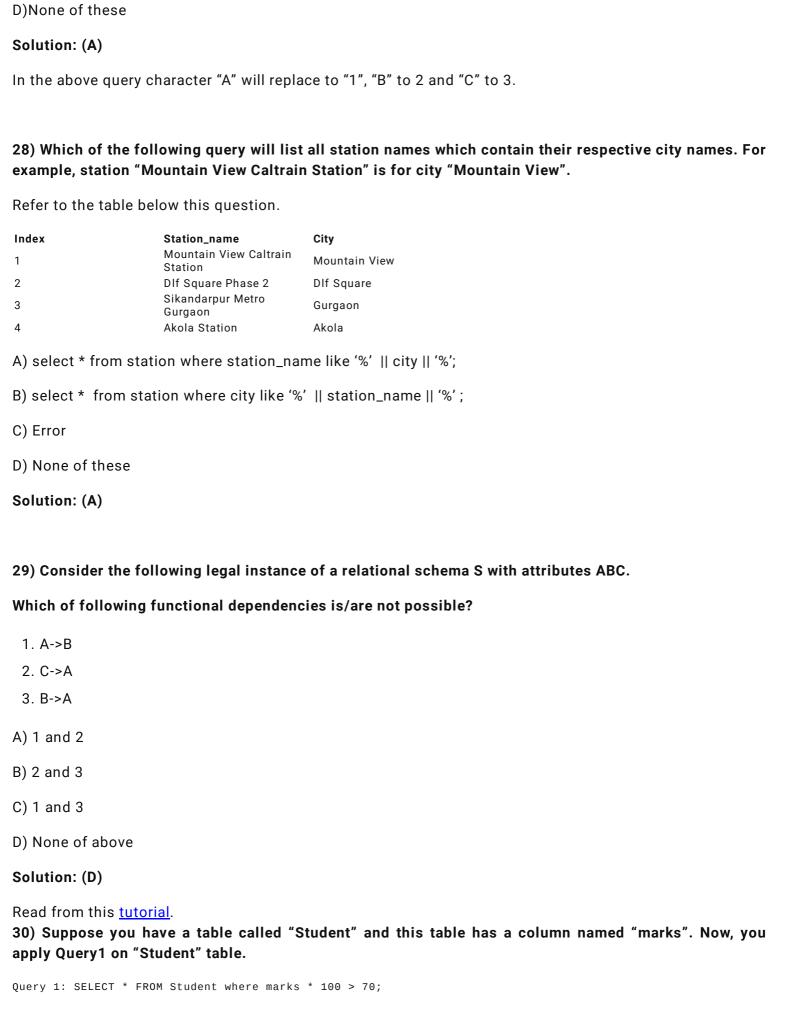
# A)

#### translate

123IT-001-1000-1V1 SU2IL-002-2000-1V2

F1IZY-007-3000-1V1

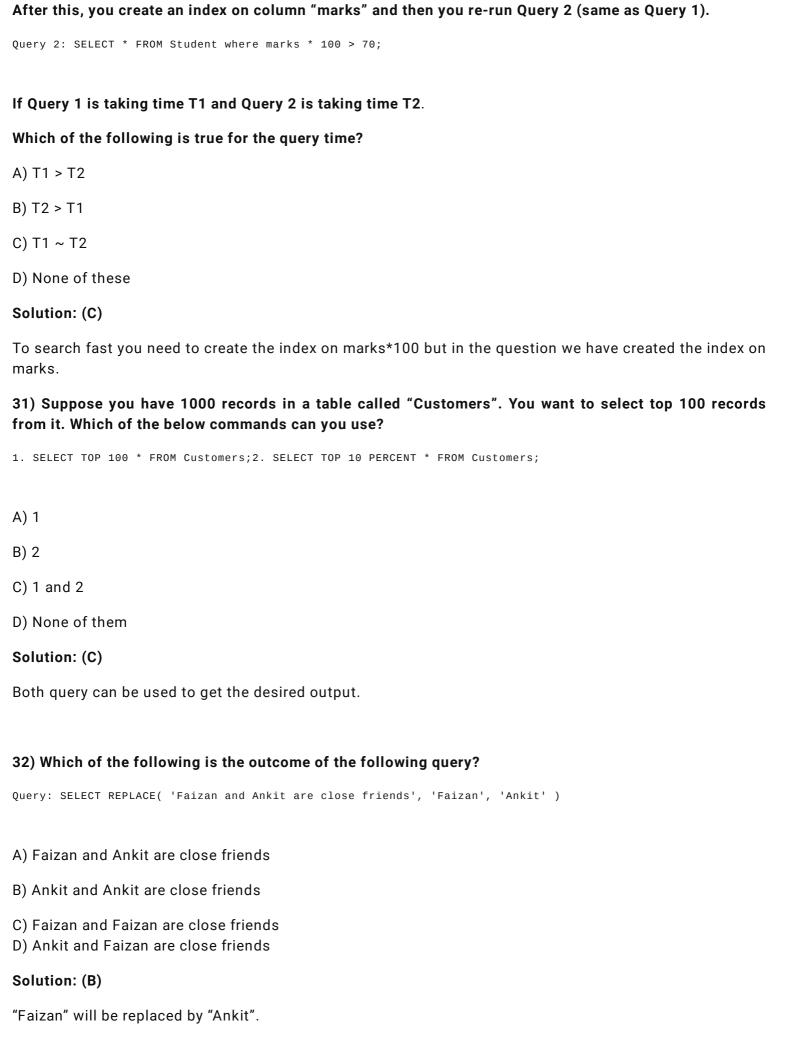
#### B)



translate

C) Error

123IT-001-1000-AV1 SUNIL-002-2000-AV2 FAIZY-007-3000-AV1



33) Which one of the following queries always gives the same answer as the nested "Query" shown

below.

Query: select \* from R where a in (select S.a from S)

- A) select R.\* from R, S where R.a=S.a
- B) select distinct R.\* from R,S where R.a=S.a
- C) select R.\* from R,(select distinct a from S) as S1 where R.a=S1.a
- D) None of above

Solution: (C)

Option C is correct.

#### **Question Context 34-35**

Consider the following table "avian" (id, name, sal).

Id	Name	Sal
1	Ankit	20
1	Faizan	10
2	Faizan	10
3	Faizan	20
1	Sunil	10
2	Sunil	20
1	Kunal	10
10	Nikam	30

# 34) Which of the following options will be required at the end of the following SQL query?

Query: SELECT P1.name FROM avian P1

# So that the appended query finds out the name of the employee who has the maximum salary?

- A) WHERE P1.sal >= Any (select P2.sal from avian P2)
- B) WHERE P1.sal <= All(select max(P2.sal) from avian P2)
- C) WHERE P1.sal > Any (select max(P2.sal) from avian P2)
- D) WHERE P1.sal >= Any (select max(P2.sal) from avian P2)

#### Solution: (D)

- B Returns the addresses of all theaters.
- C Returns null set. max() returns a single value and there won't be any value > max.
- D Returns null set. Same reason as C. All and ANY works the same here as max returns a single value.

# 35) Which of the following options can be used to find the name of the person with second highest salary?

- A) select max(sal) from avian where sal < (select max(sal) from avian)
- B) Both
- C) None of these

#### Solution: (B)

Query in the option B

"(select max(sal) from avian)"

first return the highest salary(say H) then the query

"(select max(sal) from avian where sal < H)"

will search for highest salary which is less then H.

#### **Question Context 36-39**

Suppose you are given a database of bike sharing which has three tables: Station, Trip and Weather.

#### Station Table

station	ı_id statio	n_name city	zip_code
2	М	S1	95113
3	N	S2	95112
4	L	S3	95114
5	G	\$4	95115
6	0	San Jo	se 95115
1	K	San Jo	se 95115

# Trip Table

Id	Duratio	n start_tim	e start_station_nam	e start_station_i	id end_tim	e end_station_nam	e end_station_name	bike_id
		2013-08-			2013-08			
5081	183	29 22:08:00	М	2	29 22:12:00	M )	2	309
		2013-08-			2013-08	-		
5082	100	01 22:08:00	N	3	01 22:12:00	L )	4	301
		2013-08-			2013-08	-		
5083	283	02 22:08:00	0	6	02 22:12:00	G )	5	303
		2013-08-			2013-08	-		
5084	23	09 22:08:00	M	2	10 22:12:00	0	7	305

#### **Weather Table**

#### zip\_code max\_temp min\_temp

95113	74	61
95112	70	21
95115	91	40

#### 36) Imagine, you run following query on above schema.

Query: select city , count( station\_id ) as cnt from station group by city order by cnt desc , city asc;

# Which of the following option is correct for this query?

A) This query will print city name and number of stations sorted by number of stations in increasing magnitude. If number of stations are same, it will print by decreasing order of city name.

B) This query will print city name and number of stations sorted by city name in increasing magnitude. For cities with same name, it will print by decreasing order of number of stations.
C) None of these
Solution: (A)
A is correct answer.
37) Which of the following query will find the percentage (round to 5 decimal places) of self-loop trips (which start and end at the same station) among all trips?
A)
select round(self_loop_cnt.cnt * 1.0/trip_cnt.cnt,5) as percentage from (select count(*) as cnt from trip where start_station_id = end_station_id) as self_loop_cnt ,(select count(*) as cnt from trip) as trip_cnt;
B)
select round (self_loop_cnt.cnt ? 1.0 , 5 ) as percentage from ( select count(?) as cnt from trip where start_station_id = end_station_id) as self_loop_cnt;
C)
select round (trip_cnt.cnt , 5 ) as percentage from ( select count(?) as cnt from trip) as trip_cnt;
D) None of these
Solution: (A)
Query in option A will give the desired result
38 Which of the following statements is / are true for the below query?
Query: select station_name from station where zip_code = (select zip_code from weather where max_temp = (select max(max_temp) from weather))

Note: All the zip\_code are present in table weather also present in station table

2. This query will always give more than zero records.

3. This query will always give 1 record

A) 1 and 2

B) 1 and 3

D) 1,2 and 3

Solution: (A)

C) 1

1. The query will return names of all stations where maximum temperature was found across all cities.

#### 39) What will be the output of the following query?

- C) Error
- D) None of these

#### Solution: (B)

This query will find a cumulative traveling durations of bike 301.

#### **Ouestion Context 40-42**

Suppose you are given 4 tables: Team, Player, Game and GameStats. Below are the SQL statements which create these tables.

```
CREATE TABLE Team (
                         name varchar(50) PRIMARY KEY,
                                                             city varchar(50)); CREATE TABLE Player
        playerID integer PRIMARY KEY,
                                                                position varchar(10),
                                         name varchar(50),
             weight integer, team varchar(50) REFERENCES Team(name),
                                                                             CHECK (position='Guard'
integer.
OR position='Center' OR position='Forward'));; CREATE TABLE Game (
                                                                  gameID integer PRIMARY KEY,
                                                      awayteam varchar(50) REFERENCES Team(name) NOT
hometeam varchar(50) REFERENCES Team(name) NOT NULL,
                                  awayscore integer,
NULL,
          homescore integer,
                                                         CHECK (hometeam <> awayteam)); CREATE TABLE
                playerID integer REFERENCES Player(playerID) NOT NULL,
                                                                           gameID integer REFERENCES
GameStats (
                         points integer, assists integer, rebounds integer, PRIMARY
Game(gameID) NOT NULL,
KEY (playerID, gameID)
```

# 40) Which of the following query will return distinct names of the players who play at "Guard" Position and their name contains "Jo". (ORDER BY A)

- A) SELECT name FROM player WHERE position='Guard' AND name LIKE '%jo%' ORDER BY name
- B) SELECT name FROM player WHERE position='Guard' AND name LIKE '%Jo%' ORDER BY name
- C) Both of them
- D) None of them

#### Solution: (B)

This query Finds any values that have "Jo" in any position using '%jo%' expression in command. Notice that 'Jo' is different then 'jo' because expression in like operator is case sensitive.

#### 41) What will be the output for the below query?

Query: SELECT COUNT(\*) AS num\_of\_games FROM player p1, player p2, gamestats g1, gamestats g2 WHERE p1.name='Saurabh' AND p2.name='Faizan' AND g1.playerid=p1.playerid AND g2.playerid=p2.playerid AND g1.gameid=g2.gameid AND g1.points > g2.points

- A) Return the number of games where 'Saurabh' scored more points than 'Faizan'
- B) Return the number of games where 'Saurabh' scored less points than 'Faizan'
- C) Error
- D) None of these

Solution: (A)

# 42) What is the expected output of the following query?

Query: SELECT s.playerid, AVG(s.points) AS average\_points FROM (SELECT st.playerid, st.points FROM player p, game g, gamestats st WHERE st.gameid=g.gameid AND p.team=g.hometeam AND p.playerid= st.playerid) s GROUP BY s.playerid ORDER BY s.playerid

- A) List all players' playerIDs and their average points in all home games that they played in (ORDER BY Players' playerID)
- B) List all players' playerIDs and their average points in all games that they played in (ORDER BY Players' playerID)
- C) Error
- D) None of these

Solution: (A)

# **End Notes**

I hope you enjoyed the questions and were able to test your knowledge about SQL. Irrespective of what role you are in data science, you need to know SQL. If you haven't done already, take time out to undergo the test and reflect on where you went wrong.

If you have any questions or doubts, feel free to post them below.

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