TABLEAU

1. What is Tableau?

Tableau is a BI software that visualizes and creates interactive, shareable dashboards and allows anyone to connect to their respective data. It is easy enough that any Excel user can learn it, but powerful enough to satisfy even the most complex analytical problems. With tableau, securely sharing the findings with others takes only seconds.

2. What are the differences between Tableau and other traditional BI tools?

Tableau provides easy-to-use, best-in-class, visual analytic capabilities, but it does not help with plumbing or data foundation. One can, for example, combine SQL Server with Tableau to get the complete package. Tableau licenses are relatively expensive, if one is looking to scale.

Traditional BI tools can handle it all but with significant upfront costs, higher consulting, and hardware and software costs. Among the mega-vendors, only Microsoft can provide a reasonable value proposition. Open-source vendors, such as Pentaho and Jaspersoft, do not have an abundant-enough talent pool yet.

3. What is Tableau Server?

Tableau Server is a browser- and mobile-based insight that can be used by anyone. One can easily publish dashboards with Tableau Desktop and share them through Tableau Server. It is easy to set up and even easier to run.

4. What is data visualization in Tableau?

Data visualization refers to the techniques used to communicate data or information by encoding it as visual objects, for example, points, lines, or bars, contained in graphics.

5. What are the five main products offered by Tableau?

Tableau's products support the entire cycle of self-service analytics, such as prep, analysis, sharing, etc., along with governance and data management every step of the way. Everything is integrated into the Tableau platform. There are five main products that are offered by Tableau:

- Tableau Desktop
- Tableau Server
- Tableau Online
- Tableau Reader
- Tableau Public

6. What Does Tableau Do?

Tableau's major goal is to help people see and understand data. Its software products put the power of data into the hands of everyday people, allowing a broad population of business users to engage with their data, ask questions, solve problems, and create values.

7. How is the Context Filter different from the other filters?

- Whenever one creates a Context Filter, Tableau will create a temporary table for that particular filter set, and the other filters will be applied on the Context Filter data such as cascade parameters.
- Suppose, one has created a Context Filter on USA and India, Tableau will create a temporary table for these two countries' data. If one does not have the Context Filter and has other filters, then they will be applied on these two countries' data; each record will check for all filters.

8. What are the disadvantages of the Context Filter?

- The Context Filter is not frequently changed by the user—if it is changed, then the database must be recomputed and the temporary table must be rewritten.
- When one sets a dimension to context, Tableau creates a temporary table that requires a reload each time the view is initiated. For Excel, Access, and text data sources, the temporary table created is in an Access table format. For SQL Server, MySQL, and Oracle data sources, one must have permission to create a temporary table on their server. For a multidimensional data source or cubes, temporary tables are not created. The Context Filter defines which filters are independent and which are dependent.

9. What is the latest version of Tableau Desktop?

Tableau Desktop 2023.3 (as of October 24, 2023)

10. Why Tableau?

There are many reasons to use Tableau. Whether one's data is in an on-premise database, database, data warehouse, cloud application, or Excel file, they can analyze it with Tableau. One can create views of their data and share them with colleagues, customers, and partners. One can use Tableau to blend it with other data and can keep their data up to date automatically.

11. What are filters? How many types of filters are there in Tableau?

This is one of the most frequently asked Tableau developer interview questions for the role of Tableau developer. So, it is essential to have a clear idea on this.

A filter restricts unnecessary data; it shows the exact data that is wanted by one. Basically, there are three types of filters in Tableau:

- Quick Filter
- Context Filter
- Data source Filter

12. What is aggregation and disaggregation of data?

Suppose, one has the following data:

Eid Ename Salary Dept

1.abc 2000 java

2.bbc 3000 .net

3.Krishna 2500 java

Madhu 300

5.Vamshi 3000 mainframes

1.abc 1000 testing

2.bbc 3000 tableau

3.krishna 5000.net

4.Madhu 7000 testing

vanshi 9000 tableau

1 abc 11000 Mainframes

2 bbc 13000testing

3 krishna 15000 java

4 Madhu 17000 .nte

5 vamshi 19000.net

Aggregation: To Display Aggregate Data

Sum or Avg. salary by each individual employee

Drag name on column and salary on rows, and get the sum or salary of each individual employee

Now, change the measure type as Avg.

Choose Salary Option: Choose measure types as "Avg."

Disaggregation: To Display Each and Every Transaction

When one looks at the aggregated data in the views above, each bar represents all transactions for a specific employee summed up or averaged into a single value. Now, say, one wants to see the individual salary transactions for each employee. To do that, one can create a view like that by selecting Analysis > Aggregate Measures.

13. **How to remove the Show All option from a Tableau auto filter?**

Right-click on Filter > Customize > uncheck the Show All option

14. **Can you use non-used columns, which are columns that are not used in reports but used in data sources, in Tableau filters?**

Yes. For example, in a data source, if one has columns such as EmpID, EmpName, EmpDept, EmpDsignation, and EmpSalary, and they are using EmpName on columns and EmpSalary on rows in reports, then they can use EmpDesignation on filters.

15. **What is the benefit of the Tableau extract file over the live connection?**

The Tableau extract file can be used anywhere without any connection, and one can build their own visualizations without connecting to a database.

16. **What is the difference between .twb and .twbx file extensions. Please explain.**

The file extension .twb is a live connection; it points to the data source. The user receiving .twb needs permission to access the said data source and no data is included.
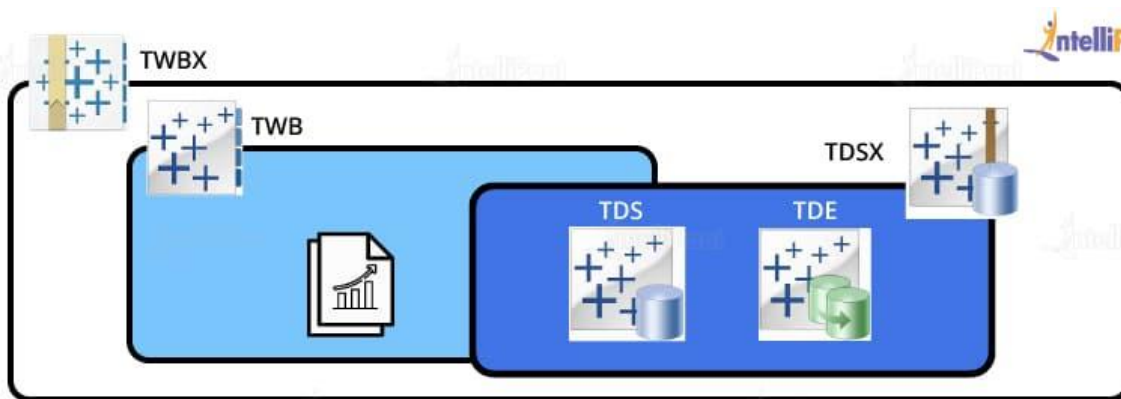
On the other hand, the file extension .twbx takes the data offline and stores it as a package or zip-like file, thereby eradicating the need for permissions.

17. **How to combine two Excel files with the same fields but different data (different years)?**

If there are two or more sheets or workbooks that need to be summarized, the Consolidate command can help pull the data together onto a single sheet.

To decide which type of consolidation to use, make sure to check the sheets that are being combined. If the data in the different sheets is in inconsistent positions, then consolidate by position even if the row and column labels are not identical.

If the sheets use the same row and column labels for their categories, then consolidate by category even if the data does not have consistent positions.

18. **What is the maximum number of tables that can be joined in Tableau?**

A maximum of 32 tables can be joined in Tableau.

19. **What are the different data types in Tableau?**

Tableau supports the following data types:

20. What are sets?

Sets are custom fields that define a subset of data based on certain conditions. The condition can be a computed condition such as a list of customers with sales over a certain threshold. Computed sets update with change in data. Alternatively, a set can also be based on a specific data point in one's view.

21. What are groups?

A group is a combination of dimension members that make higher-level categories. For instance, if one is working with a view that shows average test scores by major, then certain majors can be grouped together for major categories.

22. What is a hierarchical field?

A hierarchical field in Tableau is used for drilling down data and viewing it on a more granular level.

23. What is the difference between joining and blending in Tableau?

Data joining is useful when combining data from a single source with several tables, sheets, or others.

Data blending, on the other hand, is the combining of data from two or more different sources; one can combine the data between two sources such as Oracle, SQL Server, Excel, and others.

Example:

Consider the admission data given in a relational database and the admission target data given in an Excel spreadsheet. Now, to compare the actual admissions with the target admissions, one can perform data blending. Here, one will blend the data based on some common dimensions of both sources to access the measure of the admissions target. The two sources involved in data blending are listed as the primary and secondary sources of data. A left join is performed between the primary data source and the secondary data source, wherein all the data rows from the primary data source and only the matching data rows from the secondary data source are fetched.

Each data source in data blending includes its own collection of dimensions and measures. Data blending is useful when combining data from a variety of sources.

Data joining, on the other hand, also involves combining data but from two or more tables or sheets within the same data source.

Example:

Combining two tables from the same SQL Server, Oracle Database, DB2, or any other data source. Combining two or more worksheets in the same Excel package will also fall under data joining.

Let us understand data joining and data blending in a bit more detail:

Data Joining in Tableau

Suppose, one's client is in the healthcare domain and is using SQL Server as their database. In SQL Server, there may be many Tableau-like claims tables, rejected claims tables, customer tables, etc. Now, the client wants to know the customer-wise claims and the customer-wise rejected claims table by using Join. Join is a query that combines the data from two or more tables by making use of the Join condition.

In Tableau, Joins can be performed in two ways:

- By making use of common columns
- By making use of common data types

If, in Tableau, one creates Joins on the fields, then all the table names are suffixed with $. While performing Joins on multiple tables, one must always go with the least amount of data tables so as to improve the performance.

In Tableau, Joins are divided into two types:

- Equi Join
- Non-equi Join

Equi Join

In the Join condition, if one is using the equality, "=", operator, it is called Equi Join. It is further divided into three types:

- **Inner Join:** Inner Join will load the only matching records from both tables. Below is the Inner Join condition:

Tableaa.id = Tableb.id

- **Outer Join:** Outer Join is further divided into three types:

- o **Left Outer Join:** Displays the complete data from the left table + matching records from the right.

Condition:

tablea.id(+)

- **Right Outer Join:** Displays the complete data from the right table + matching records from the left.

Condition:

tablea.id(+)=tableb.id

- **Full Outer Join:** Loads the complete data from the left table and the right table.

Condition:

Table A full outer join Table B ON tablea.id= tableb.id

- **Self Join:** If one is performing a Join to a table with itself, such a kind of Join is called a Self Join.

Non-equi Join

In the Join condition, if one is using operators apart from the equality, "=", operator, such as "<", ">", "<=", ">=", and "=!", then such a kind of Join is called a non-equi Join.

Data Blending in Tableau

Consider the same client. Suppose, they are operating their services in Asia, Europe, North America, etc., and they are maintaining the Asia data in SQL, the Europe data in SQL Server, and the North America data in MySQL.

Now, the client wants to analyze their business around the world in a single worksheet. In this case, one cannot perform a Join. Here, one has to make use of the data blending concept.

Data Blending

Normally, in Tableau, one can perform the analysis on a single data server. If one wants to perform the analysis of data from multiple data sources in a single sheet, then one has to make use of this new concept called data blending.

Data blending mixes the data from different data sources and allows users to perform the analysis in a single sheet. Blending means mixing, and when one is mixing the data sources, then it is called data blending.

Rules to Perform Data Blending

The following are the rules of performing data blending:

- If one is performing data blending on two data sources, then the two data sources should have at least one common dimension.
- In that common dimension, at least one value should be matching.

In Tableau, one can perform data blending in two ways:

- **Automatic Way:** Here, Tableau automatically defines the relationship between the two data sources based on the common dimensions and based on the matching values, and the relationship is indicated in orange.
- **Custom or Manual Way:** In the custom way, one needs to define the relationship manually.

Data Blending Functionality

- All the primary and secondary data sources are linked by a specific relationship.
- While performing data blending, each worksheet has a primary connection, and optionally it might contain several secondary connections.
- All the primary connections are indicated in blue in the worksheet and all the secondary connections are indicated with an orange-colored tick mark.
- One sheet contains one primary data source and can contain n number of secondary data sources.

24. What are dimensions and facts?

- Dimensions are nothing but descriptive text columns. For example, product name, city, etc.
- Facts are the measures (numerical values). For example, sales, profit, etc.

25. What is data modeling?

This question is present in almost all Tableau interview questions blogs. Get an idea on this.

Data modeling is the analysis of data objects that are used in a business or other contexts and the identification of the relationships among these data objects. Data modeling is the first step in performing object-oriented programming.
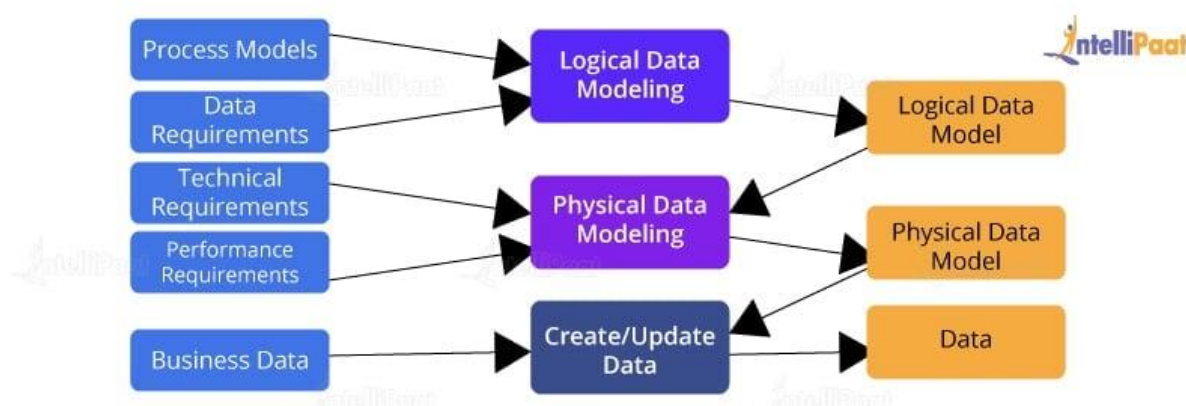
26. Can you place an Excel file in a shared location and use it to develop a report and refresh it in regular intervals?

Yes, it can be done, but for better performance, one has to use Extract.
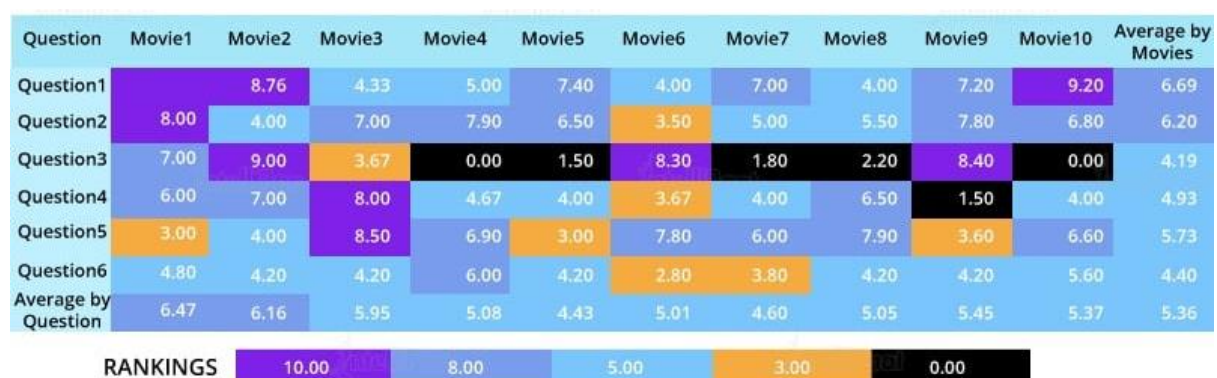
27. Compare QlikView with Tableau

There are many differences between QlikView and Tableau. Let us see how through them in the table below:

Criterion	Tableau	QlikView
Performance	Tableau uses the cubing technique, which generates results slower than QlikView.	QlikView is faster and can effortlessly combine all sizes of datasets.

Interface	Tableau has a simple, easy, clean, and interactive drag-and-drop interface.	The interface of QlikView has too many tools on its menu, many of which are rarely used.
Capabilities	Tableau has real-time visualization.	QlikView has strong visualizations with BI reporting.
Suitable for	Tableau is suitable for dashboarding and rapid visualizations.	QlikView is suitable for departmental and enterprise-wide BI solutions.
Product Range	Tableau has diverse products for varied applications.	QlikView has a single product for the entire BI solution.
Gauge Charts and 3D Graphs	Tableau does not support gauge charts and 3D graphs.	Gauge charts and 3D graphs are available in QlikView.
Geographical Maps	Tableau has an inbuilt extension to perform map visualization.	Building map visualization takes longer in QlikView since it needs scripting and external extension.
Tables	Tableau is weaker in tables.	QlikView is very good for tables.
Speed	Tableau's speed depends on the RAM and the source database.	QlikView's speed depends on the RAM.
Graphical Inputs and Changes	Tableau's drag-and-drop functionality makes graphical inputs and changes easy.	QlikView requires written logic for graphical inputs and changes.

28. What is the difference between heat map and treemap?

- A heat map is a great way to compare categories using color and size. In a heat map, one can compare two different measures.

Question	Movie1	Movie2	Movie3	Movie4	Movie5	Movie6	Movie7	Movie8	Movie9	Movie10	Average by Movies
Question1		8.76	4.33	5.00	7.40	4.00	7.00	4.00	7.20	9.20	6.69
Question2	8.00	4.00	7.00	7.90	6.50	3.50	5.00	5.50	7.80	6.80	6.20
Question3	7.00	9.00	3.67	0.00	1.50	8.30	1.80	2.20	8.40	0.00	4.19
Question4	6.00	7.00	8.00	4.67	4.00	3.67	4.00	6.50	1.50	4.00	4.93
Question5	3.00	4.00	8.50	6.90	3.00	7.80	6.00	7.90	3.60	6.60	5.73
Question6	4.80	4.20	4.20	6.00	4.20	2.80	3.80	4.20	4.20	5.60	4.40
Average by Question	6.47	6.16	5.95	5.08	4.43	5.01	4.60	5.05	5.45	5.37	5.36

RANKINGS	10.00	8.00	5.00	3.00	0.00

- A treemap is a very powerful visualization, particularly used for illustrating hierarchical or tree-structured data. It can be used for visualizing a part of or a whole relationship.

29. What are dual axes?

To display two measures in one graph, Tableau uses dual axes.

30. What is a blended axis?

Blended axis is the axis where multiple measures are shown in a single axis and all the marks are shown in a single pane.

- Drag a dimension in a column
- Drag the first measure in the column
- Drag the second measure in the existing axis
- Us/multiplemeasures_blendedaxes.html

31. What makes Tableau stand out?
Tableau stands out for several reasons:

- First, most BI tools are pricey, but Tableau has a free offering, Tableau Public, and a very popular academic distribution, which also happens to be free.
- Tableau is well recognized by firms such as Forrester Research to be one of the most easy-to-use and agile products currently available.
- Unlike some other BI tools, Tableau is not a complete technology stack; it is mostly useful for visualization and analytics.

32. How is testing done in Tableau?

Testing cannot be performed in Tableau. It is a data visualization software.

33. Can you get values from two different sources as a single input into parameters?

Tableau currently does not support multi-valued parameters.

Case Study: The dynamic-parameter-with-a-blend technique can be used to highlight a single value, but not multiple values because of the way it works. As Tableau parameters are not dynamic, one cannot filter the list of values at runtime.

34. How are parameters used in Tableau?

One can use parameters with filters, calculated fields, actions, measure swaps, changing views, and auto updates.

35. What is the use of the new custom SQL query in Tableau?

The custom SQL query is written after connecting to data for pulling the data in a structured view. For example, suppose, one has 50 columns in a table, but they only need 10 columns. So, instead of taking 50 columns, one can write an SQL query. This will increase the performance.

36. What are the similarities and differences between Tableau and Palantir?

Palantir and Tableau are very different. Palantir has its roots in large data computer science problems involving security, payments, fraud detection, etc. Its customers or investors include PayPal, CIA, etc.

Tableau is a visualization player with roots in Stanford University Research. Tableau's Visual Query Language (VizQL) allows users to build visualizations on top of the standard data warehouses or spreadsheets.

37. How to create cascading filters without using the Context Filter?

Suppose one has Filter1 and Filter2. Based on Filter1, one needs to use Filter2 on the data. Consider Filter1 as "Country" and Filter2 as "States".

Consider "India" and the "Country"; so, Filter2 should display only the states of India.

Choose options of Filter2 states:

Select the option of "Only relevant values".

38. Is Tableau good for a strategic acquisition?

Yes, for sure! It gives astute data insights and helps in planning, pointing out the anomalies, and improvising the processes.

39. How to display the top five and the last five sales in the same view?

The top five and the last five sales can be displayed in the same view by using filters or calculated fields.

40. Suppose I want to design a view, without using a line or bar chart, to show the region-wise profit and sales. How should I go about doing it? Explain.

- Generate a map using cities
- Then, drag the profit and sales to Details
- Add the state as a Quick filter

41. Design a view in a map such that if a user selects any state, the profit and sales in the cities under that state show up

If one wants to show the sales and profit of each and every city under the states in the same worksheet, then they should first have State, City, Sales, and Profit fields in their dataset.

- Double-click on the State field
- Drag City and drop into the Marks card, which is under the State field
- Drag Sales and drop into Size
- Drag Profit and drop into Color
- Click on Size legend and increase the size (75%)
- Right-click on the State field and select Show Quick filter
- Select any state and check whether you got the required view or not
- In this, the view size indicates the number of sales and the color indicates the profit values.

42. How to add custom color in Tableau?

Create Custom Color code in "Preferences.tps"

Documents » My Table Repository » Preferences.tps

Then, add custom color code

Note: In Tableau 9.0, there is a color picker option.

43. How can one combine a database and the flat file data in Tableau Desktop?

- Connect data twice, once for database tables and then for the flat file. The Data->Edit Relationships
- Give a Join condition on the common column from DB tables to the flat file

44. What is Tableau Public?

Tableau Public is a free service that lets anyone publish interactive data to the web. Once on the web, anyone can interact with the data, download it, or create their own visualizations for it. No programming skills are required here. One can also check out the gallery to see some of the things people have been doing with Tableau Public.

45. What is your daily work process in Tableau?

I think we all work on different projects using Tableau, so the work begins from understanding the requirement and getting the required data, creating a storyboard, creating visualizations in Tableau, and then presenting it to the client for review.

46. What are parameters in Tableau? How do they work?

Parameters are dynamic values that can replace constant values in calculations and can serve as filters.

47. What are the different connections that can be made with a dataset?

One can either connect live to their data set or extract data to Tableau.

- **Live:** Connecting live to a dataset leverages its computational processing and storage. New queries go to the database and are reflected as new or updated in the data.
- **Extract:** It is a compressed snapshot of the data that is stored on disk and loaded into memory as required for use by Tableau's data engine. The snapshot can be refreshed on a recurring schedule either as a whole or as incrementally appended data. These schedules are set up by using the Tableau server..

48. What is Tableau Data Engine?

Tableau Data Engine is an analytical database and a feature in Tableau that has been designed to achieve instant query response and predictive performance. It seamlessly

integrates into existing data infrastructure and is not limited to loading complete datasets into memory.

Tableau Data Engine does take some time to import, create indexes, and sort large volumes of data. However, it eventually speeds up after these processes. Tableau Data Engine is not in-memory technology. The data is stored in the disk after it is imported, and the RAM is hardly used.

49. **How to do performance testing in Tableau?**

Performance Testing can be done by loading Testing Tableau Server with TabJolt, which is a point-and-run load generator for performing quality analysis (QA). However, TabJolt is not supported by Tableau directly and has to be installed using other open-source products.

50. **How does Tableau work with large datasets?**

Tableau's performance is based on the performance of the data source. If the data source takes more time to execute a query, then Tableau must wait up to that time.

51. **How is a workbook published and scheduled in Tableau Server?**

- First, create a schedule for a particular time and then create an Extract for the data source and publish the workbook on the server.
- Before publishing it, there is an option called "Scheduling and Authentication". Click on that and select the schedule from the drop-down and then publish. Also, publish data sources and assign the schedule. This schedule will automatically run for the assigned time and the workbook will get refreshed on a regular basis.

52. **Distinguish between parameters and filters**

- Parameters are dynamic values that can replace constant values in calculations. Parameters can serve as filters as well.
- Filters, on the other hand, are used to restrict the data based on a condition that is mentioned in the filters shelf.

53. **How to view an SQL generated by Tableau Desktop?**

Tableau Desktop log files are located in C:Users\MyDocuments\MyTableau Repository. If one has a live connection to the data source, then they need to check

the log.txt and tabprotosrv.txt files. If one is using Extract, then they have to check the tdeserver.txt file. The tabprotosrv.txt file often shows detailed information about queries.

54. What is a Page shelf?

A Page shelf is a powerful part of Tableau that can be used to control the display and the printed results of the output.

55. What are the major differences between Tableau 7.0 and Tableau 8.0?

- Introduction of new visualizations such as treemap, bubble chart, and box and whisker plot
- Option to copy worksheets directly from one workbook to another
- Introduction of R script

56. How to create filled maps?

- **Step 1:** Build a Map View, double-click on a geographic field such as State, Area Code, Zip Code, etc.
- **Step 2:** Select the Filled Map Mark Type; the automatic mark type will show this type of view as circles over a map. On the Marks card, select Filled Map to color the geographic areas.
- **Step 3:** Drag a Field to the Color shelf, define how the locations are colored by dragging another field to the Color shelf.

57. Does a parameter have its own drop-down list?

Yes, it may have its own drop-down list. The entries one makes in a parameter while creating it can be viewed as items in the drop-down list.

58. How to rectify SQL performance for developed dashboards?

After the creation of dashboards in Tableau, if there is a problem from the SQL side, it means Custom SQL. Rather than using custom SQL connections in Tableau, it is better to use SQL statements creating a view inside of the database, then connecting that to Tableau. This will streamline the efforts without hunkering them down with the rest of the SQL, which are generated by Tableau without the custom SQL subquery.

59. Is it possible to store a large amount of data in a memory engine using Tableau? If yes, how can it be done?

Yes, it can be possible.

But this question does not have a straight answer since one can store a large amount of data differently on the basis of the different configurations of Tableau Server implementation, such as 8 cores, 16 cores, etc. Not just if Hyper is used or not, but other factors such as server memory may also affect the amount of data that can be stored.

Note: When dumping a large amount of data on Tableau Server, one has to make sure that this data volume should not affect the dashboard's performance, the response time, and the processing time for extracts. This is where Tableau's efficiency is enhanced by Hyper.
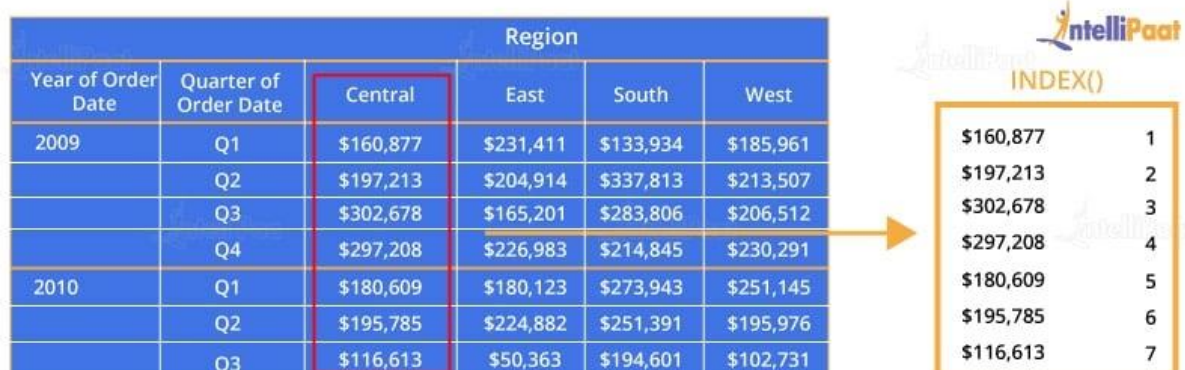
60. How is Tableau different from traditional reporting or BI tools?

Traditional BI solutions are powerful and can provide scaling and reliability, and they have been endorsed by various well-established software firms. These solutions provide ample security for data, good BI technical knowledge and skills are needed to work with them. Oracle BI and QlikView are two examples of traditional BI tools.

Tableau is one of the top BI tools used in the industry today, providing easy operation and understanding without much knowledge of BI competencies. It has simple drag-and-drop functionality and a smart way to categorize data fields. However, in Tableau Public, data security is not provided, while in the professional version, security is enabled.

## 61. What is the difference between INDEX and RANK in Tableau?

RANK and INDEX come under table calculations in Tableau. INDEX mainly deals with a record's physical position. Incremental numbers are assigned according to the record's physical order.

Year of Order Date	Quarter of Order Date	Region			
		Central	East	South	West
2009	Q1	$160,877	$231,411	$133,934	$185,961
	Q2	$197,213	$204,914	$337,813	$213,507
	Q3	$302,678	$165,201	$283,806	$206,512
	Q4	$297,208	$226,983	$214,845	$230,291
2010	Q1	$180,609	$180,123	$273,943	$251,145
	Q2	$195,785	$224,882	$251,391	$195,976
	Q3	$116,613	$50,363	$194,601	$102,731

INDEX()

$160,877	1
$197,213	2
$302,678	3
$297,208	4
$180,609	5
$195,785	6
$116,613	7

While, RANK deals with a record's value. The highest value gets the highest rank and the lowest value gets the lowest rank.

Rank Chart in Table
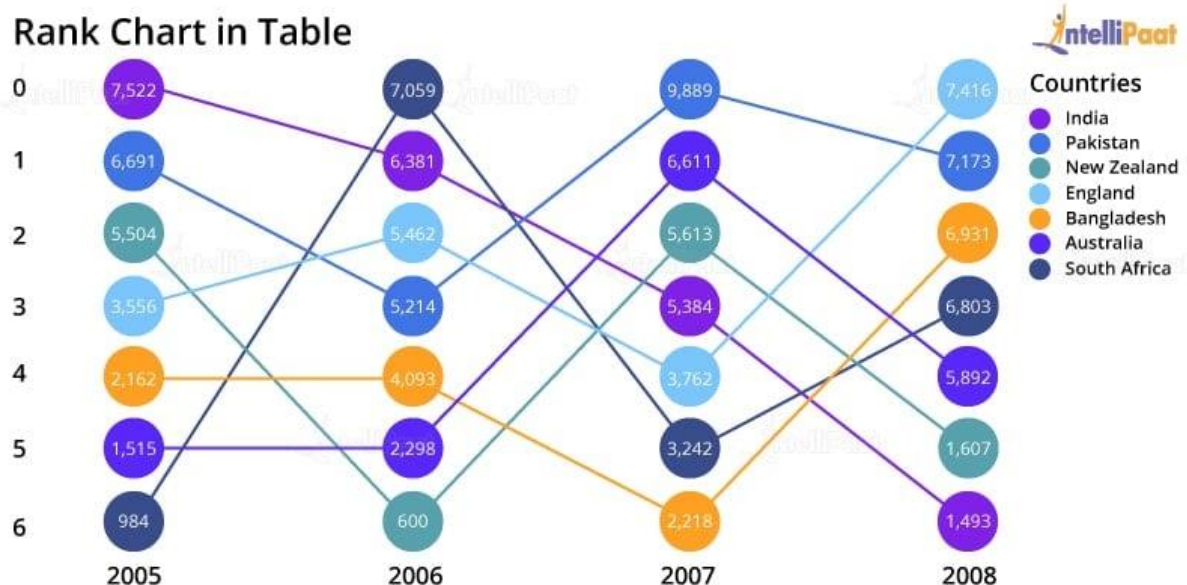
62. How to automate reports in Tableau?

One will see the option to schedule reports when uploading a report on Tableau Server. One can click on this button to set the time to refresh the data.

63. Suppose my license expires today. Will my users still be able to view the dashboards or workbooks that I have published on the server earlier?

If your server license expires today, then your username on the server will have the role "unlicensed', which means that you do not have access but others do have access. The Site Admin can "Change Ownership" to another person, so that the Extracts, if enabled, do not fail.

64. Assume that I am using Tableau Desktop and have a live connection to Cloudera Hadoop data. I need to press F5 to refresh the visualization. Is there any way to automatically refresh the visualization every x minutes instead of pressing F5 every time?

Here is how you can refresh the dashboard every three seconds:

- Replace api src and the server URL with yours. The interval below is for three seconds.

  Tableau JavaScript API

65. What are the differences among Tableau, GoodData, and other traditional BI tools such as BusinessObjects, etc.?

There are four major differences among Tableau, GoodData, and other traditional BI tools:

- **Speed:** How fast can one get up and running with the system, answer questions, design and share dashboards, and then change them? This is where systems such as Tableau and GoodData are far better than the traditional BI tools such as BusinessObjects or Cognos. Traditional systems took months or years to implement, with costs running to millions. Tableau has a free trial version that gets installed in minutes, and GoodData is cloud-based; so, they are faster to implement by orders of magnitude. They are also faster in giving results; traditional BI tools require IT knowledge and business users are mostly stuck in a queue waiting for developers to make changes to the reports in order to get anything done. Tableau and GoodData provide a more self-service experience.

- **Analysis:** This is where Tableau excels as it has a powerful and flexible drag-and-drop visualization engine. GoodData and traditional BI tools typically provide some canned reports but changing them requires significant time and money.

- **Data Layer:** This is where the three options are the most different. GoodData requires us to move our data to its cloud. Traditional BI tools typically require us to move our data to its data warehouse. On the other hand, Tableau connects to a variety of existing data sources and also provides a fast in-memory data engine, essentially a local database. Since most enterprises have their data stored all over the place, this provides the most convenient choice and lets them use the investment that they have already made.

- **Enterprise Readiness:** Traditional BI and Tableau do well with enterprise-level security and high scalability.

66. Explain the integration of Tableau with R.

R is a popular open-source environment for statistical analysis. Tableau Desktop can now connect to R through calculated fields and take advantage of R functions,

libraries, and packages, and even the saved models. These calculations dynamically invoke the R engine and pass values to R via the reserve package, and they are then returned   to   Tableau.
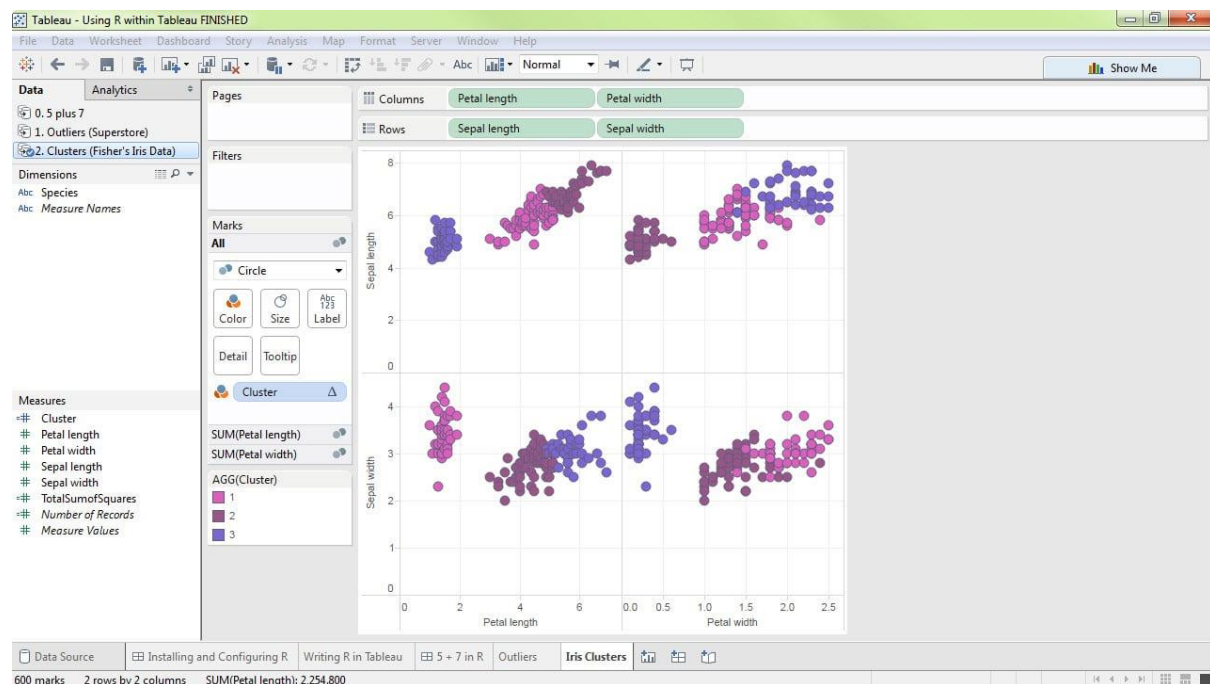
- Tableau Server can be configured to connect to an instance of Reserve through the tabadmin utility, allowing anyone to view a dashboard containing the R functionality.
- Combining R with Tableau gives one the ability to bring deep statistical analysis into the drag-and-drop visual analytics.

67. What is the difference between the quick filter and the normal filter in Tableau?

The quick filter is used to view the filtering options and can be used to select options. While the normal filer is something with which one can limit the options from the list or use some conditions to limit the data by field or value.

68. When publishing workbooks on Tableau online, why does an error appear occasionally about needing to extract?

This will happen whenever a user tries to publish a workbook that is connected to a file that is stored on a local drive, such as a SQL server, or an internal server that is within an enterprise's network.

69. How can one embed views on to web pages?

One can do the following to embed views and adjust the default appearance:

- **Get the embed code provided with the view:** The Share button, which is at the top of each view, includes an embed code that can be copied and pasted on to a web page. (The Share button does not appear in embedded views if the show Share Options parameter is changed to false in the code).
- **Customize the embed code:** The embed code can be customized with parameters that control the toolbar, tabs, and more.
- **Use the Tableau JavaScript API:** Tableau JavaScript objects can be used in web applications. See the Tableau Developer Portal to get access to the API, code examples, documentation, and Tableau developer community.