Power BI Assignment 2

1. Explain the advantages of Natural Queries in PowerBi with an example?

   Natural Language Query is the ability to use natural language expressions to discover and understand data and accelerates the process of finding answers that data can provide.

   Sometimes the fastest way to get an answer from your data is to perform a search over your data using natural language. The Q&A feature in Power BI lets you explore your data in your own words by using natural language. Q&A is interactive, even fun. Often, one question leads to others as the visualizations reveal interesting paths to pursue. Asking the question is just the beginning. Travel through your data, refining or expanding your question, uncovering new information, zeroing in on details, or zooming out for a broader view. The experience is interactive and fast, powered by an in-memory storage.

   Power BI Q&A is free and available to all users. In Power BI Desktop, report designers can use Q&A to explore data and create visualizations. In the Power BI service, everyone can explore their data with Q&A. Our mobile apps support Q&A, too. Use the Q&A virtual assistant in iOS and the Q&A visual on Android devices. If you have permission to edit a dashboard or report, you can pin your Q&A results.

   Some advantages of using natural language querying tools include the following:

- Benefit #1 – Guided NLQ is a unique self-service BI experience
- Benefit #2 – Every question is understood by Guided NLQ
- Benefit #3 – Guided NLQ makes it simple to ask complex questions
- Benefit #4 – Guided NLQ is integrated throughout Yellowfin
- Benefit #5 – It’s easy to embed Guided NLQ into your applications

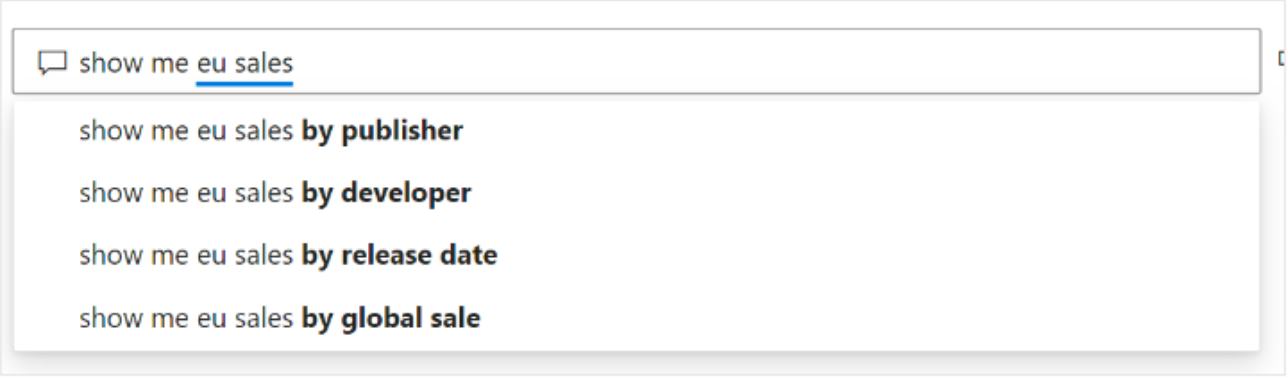
Even before you start typing, Q&A displays a new screen with suggestions to help you form your question. Start from one of the suggested questions or type your own question. Q&A supports a wide range of questions. You can:

- Ask natural questions Which sales has the highest revenue?
- Use relative date filtering Show me sales in the last year
- Return only the top N Top 10 products by sales
- Provide a filter Show me sales in the USA
- Provide complex conditions Show me sales where product category is Category 1 or Category 2
- Return a specific visual Show me sales by product as pie chart
- Use complex aggregations Show me median sales by product
- Sort results Show me top 10 countries/regions by sales ordered by country/region code
- Compare data Show me date by total sales vs total cost

- View trends Show me sales over time

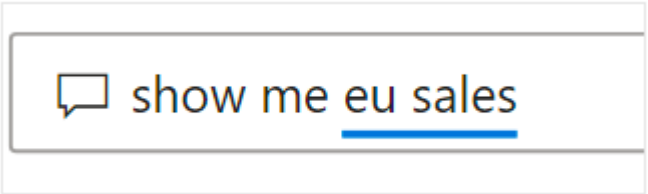
Autocomplete

As you type your question, Power BI Q&A shows relevant and contextual suggestions to help you quickly become productive with natural language. As you type, you get immediate feedback and results. The experience is similar to typing in a search engine.



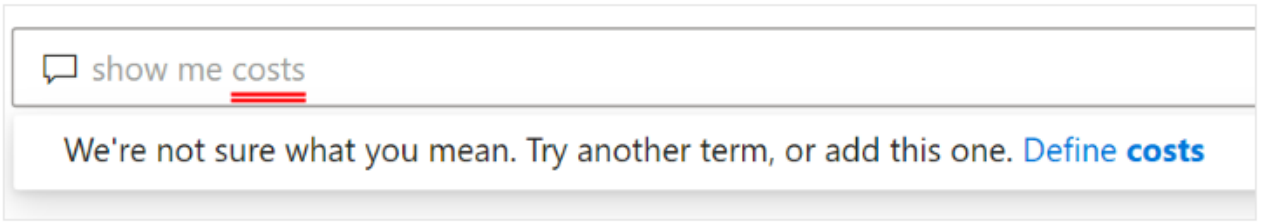
Red/Blue/Orange underlines

Q&A shows words with underlines to help you see which words the system recognized or didn't recognize. A solid blue underline indicates that the system successfully matched the word to a field or value in the data-model. The following example shows that Q&A recognized the words EU Sales.



An orange dotted underline indicates that the word or phrase is categorized as low confidence. If you enter a vague or ambiguous word, the field is underlined in orange dots. An example could be the word 'Sales'. Multiple fields could contain the word 'Sales', so the system uses an orange dotted underline to prompt you to choose the field you mean. Another example of low confidence could be if you enter the word 'area', but the column it matches is 'region'. Power BI Q&A recognizes words that mean the same thing thanks to the integration with Bing and Office and also interpreting renames from within a report as potential suggestions. Q&A underlines the word with orange dots, so you know it's not a direct match.

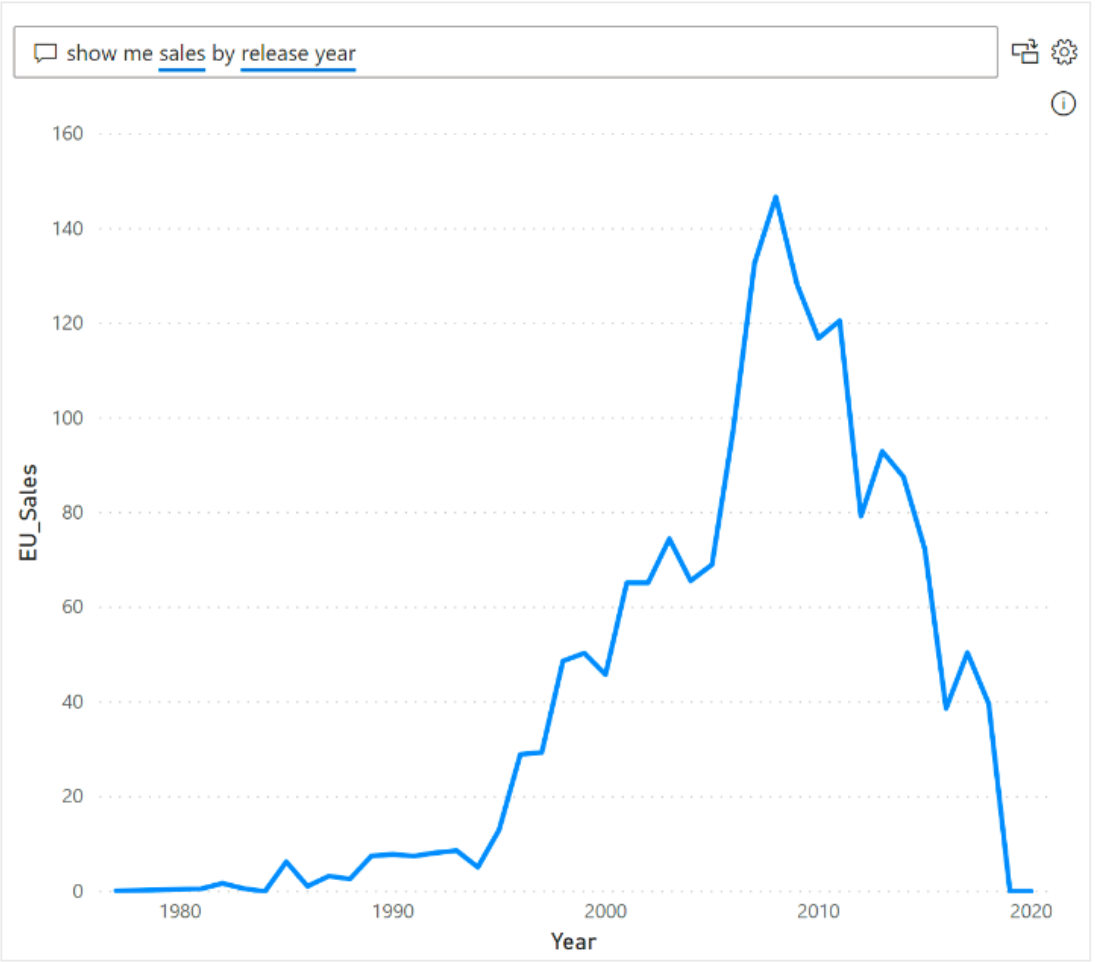
A red double-underline means Q&A didn't recognize the word at all. You could encounter this issue by using a domain-specific term that isn't mentioned anywhere in the data, or the data fields are incorrectly named. An example could be using the word 'Costs' if the word doesn't exist anywhere in the data. The word is in the English dictionary, but Q&A marks this term with a red double-underline to indicate it can't find this term in the data.



Visualization results

As you enter your question, Q&A tries to instantly interpret and visualize the answer. As part of the latest updates, Q&A now tries to interpret the question and plot the fields automatically to the correct axis. For example, if you enter 'Sales by year', Q&A detects that year is a date field and always prioritizes placing this field on the X axis. If you want to change the visualization type, enter 'as chart type' after the question. Q&A currently supports these types of visualizations:

- Line chart
- Bar chart
- Matrix
- Table
- Card
- Area
- Pie chart
- Scatter/Bubble chart
- Map



Add Q&A to a report

To add Q&A to a report in Power BI Desktop or the Power BI service, you can:

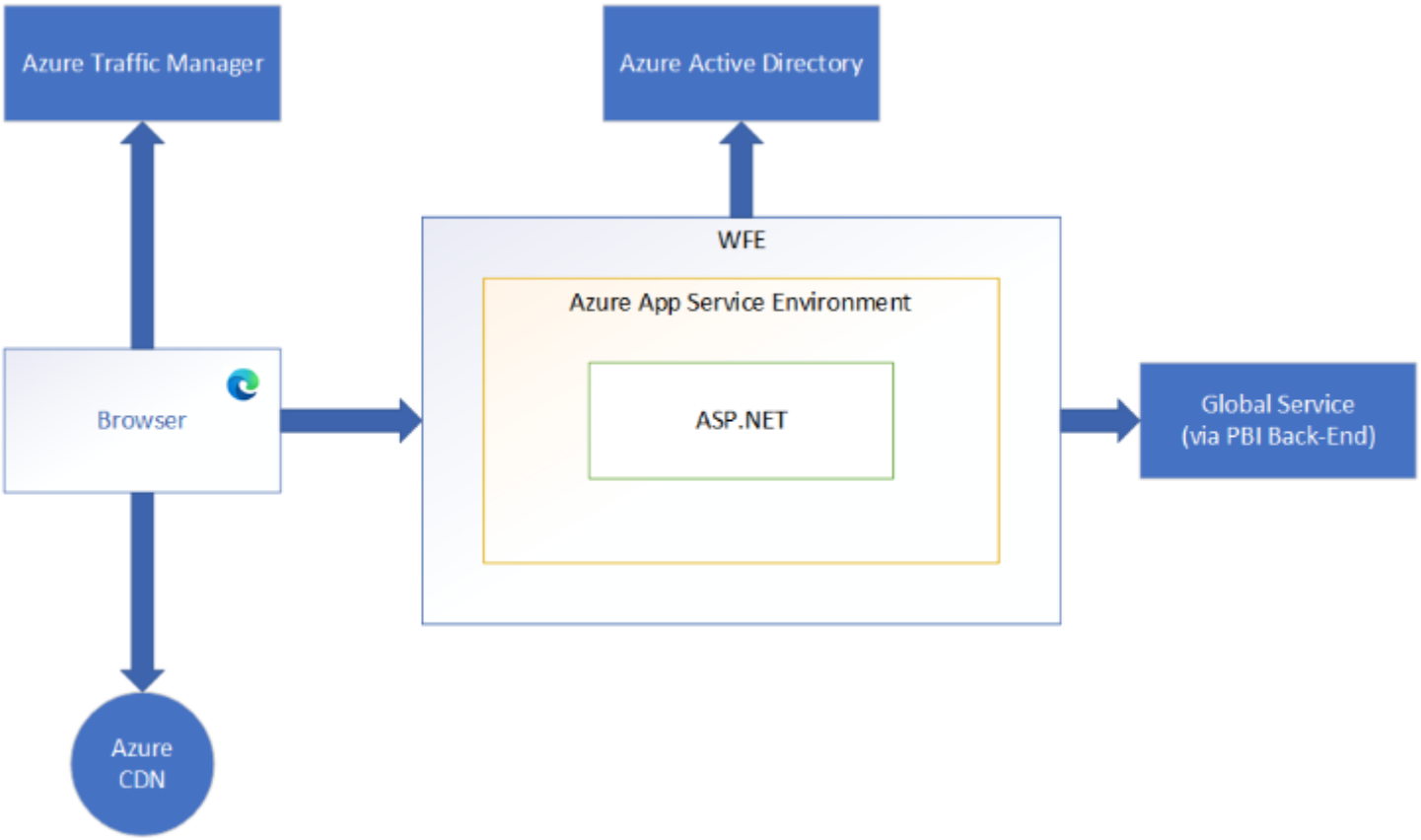
- Add a Q&A visual.
- Add a Q&A button.

To add the Q&A visual to a report, select the Q&A icon, or select the Q&A visual in the Visualization pane. You can also double-click anywhere on the report canvas to automatically insert the Q&A visual. To add a button, select Buttons > Q&A from the Insert ribbon. You can completely customize the Q&A button image.

2. Explain Web Front End(WFE) cluster from Power BI Service Architecture?

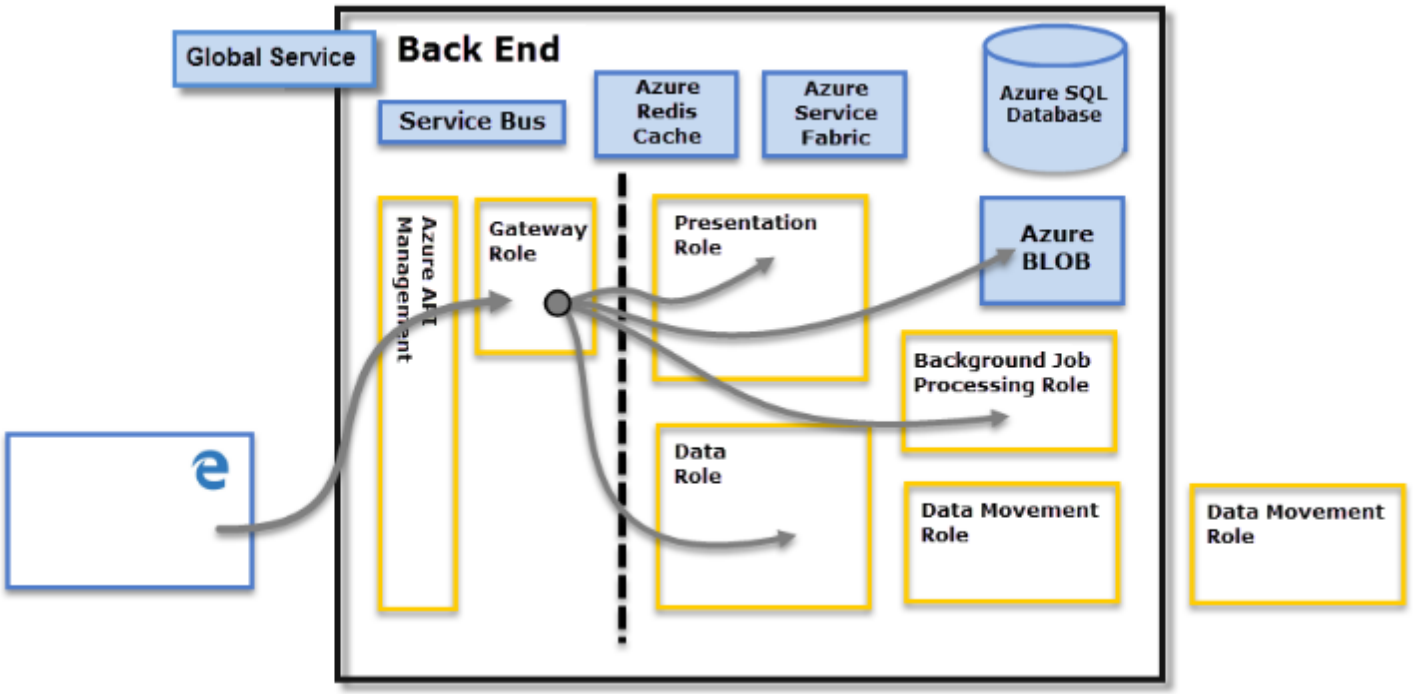
The Web Front End (WFE) cluster manages the initial connection and authentication to the Power BI service.
A WFE cluster consists of an ASP.NET website running in the Azure App Service Environment. The WFE cluster uses Azure AD to authenticate clients, and provide tokens for subsequent client connections to the Power BI service. Power BI uses the Azure Traffic Manager (Traffic Manager) to direct user traffic to the nearest datacenter. Traffic Manager directs requests using the DNS record of the client attempting to connect, authenticate, and to download static content

and files. Power BI uses the Azure Content Delivery Network (CDN) to efficiently distribute the necessary static content and files to users based on geographical locale.



3. Explain Back End cluster from Power BI Service Architecture?

The back-end cluster is the backbone of all the functionality available in Power BI. It consists of several service endpoints consumed by Web Front End and API clients as well as background working services, databases, caches, and various other components.
The back end is available in most Azure regions, and is being deployed in new regions as they become available. A single Azure region hosts one or more back-end clusters that allow unlimited horizontal scaling of the Power BI service once the vertical and horizontal scaling limits of a single cluster are exhausted.
Once authenticated, the Back-End handles all subsequent user interactions. Power BI uses Azure Active Directory (Azure AD) to store and manage user identities. Azure AD also manages data storage and metadata using Azure BLOB and Azure SQL Database, respectively.
The Back-End cluster determines how authenticated clients interact with the Power BI service. The Back-End cluster manages visualizations, user dashboards, datasets, reports, data storage, data connections, data refresh, and other aspects of interacting with the Power BI service. The Gateway Role acts as a gateway between user requests and the Power BI service. Users don't interact directly with any roles other than the Gateway Role. Azure API Management eventually handles the Gateway Role.



4. What ASP.NET component does in Power BI Service Architecture?

   Clients and the back end are connected by the front end, commonly known as the web front-end cluster. A WFE cluster consists of an ASP.NET website running in the Azure App Service Environment. The front-end services use ASP.NET components to handle the initial connection and Azure Active Directory client authentication. User IDs are kept in the Azure Active Directory. After authentication, user requests are routed through Azure Traffic Manager to the closest data center. The Azure Content Delivery Network (CDN) makes static Power BI content and files available to users when a client or user has been authorized.

5. Compare Microsoft Excel and PowerBi Desktop on the following features:
   - Data import
   - Data transformation
   - Modeling
   - Reporting
   - Server Deployment
   - Convert Models
   - Cost

Microsoft Excel	Power BI Desktop

Data Import	
Microsoft Excel's connectivity capacity is limited.	Power BI can connect to a large number of data sources.
Data Transformation	
Excel is used to organize data, transform it and perform mathematical operations and calculations. Excel has limitations in the amount of data it can work with.	Power BI is conceived as a Business intelligence and data visualization tool for businesses. Power BI can handle much larger amounts of data. Power BI transforms data in a correlative and interactive manner to analyze, extract and visualize it.
Modeling	
Excel is focused on Structured and Simple Data Models with a wide range of features.	Power BI is really focused on Data Ingest and building potentially complex data models easily.
Reporting	
Excel reports are normal and Ordinary compared to Power BI. Microsoft Excel offers you a limited range of dashboards if you look at interactivity and the range of functions. It has a tabular data format that can help you visualize data with various chart formats. However, it is not an ideal tool for larger datasets.	Power BI allows advanced features in Cross Filtering between charts. Power BI has a cohort of powerful features like easy formatting, natural language querying, resizing, editing, and filtering that make the reports easy to understand, and visually attractive, while helping you draw multi-faceted insights to guide the decision-making process. Power BI's reports are highly dynamic and interactive.
Server Deployment	
Server Deployment in Excel is not possible.	The deployment process lets you clone content from one stage in the deployment pipeline to another, typically from development to test, and from test to production. During deployment, Power BI copies the content from the current stage, into

	the target one.
Convert Models	
Conversion of models is not as easy in Excel as it is in Power BI. Also, Excel focuses on simple data models.	There are many default models available in Power BI. The models can be easily converted from one type to another just by clicking over any model type in visualisation.
Cost	
Since we already have Excel, we need to spend additional money to procure this and build dashboards.	Power BI Desktop is free to download and use for personal use, but it takes $10 per month per user to share reports with others.

6. List 20 data sources supported by Power Bi desktop.

   With Power BI Desktop, you can connect to data from many different sources.
   To see available data sources, in the HOME group of the Power BI Desktop ribbon, select the GET DATA button label or down arrow to open the COMMON DATA SOURCES list. If the data source you want isn't listed under COMMON DATA SOURCES, select MORE to open the GET DATA dialog box.
   Or, open the GET DATA dialog box directly by selecting the GET DATA icon itself.
   Some of the data sources supported by Power BI Desktop are:

   1. Excel
   2. Power BI datasets
   3. Power BI dataflows
   4. Dataverse
   5. SQL Server
   6. Analysis Services
   7. Text/CSV
   8. Web
   9. OData feed
   10. Blank query
   11. XML
   12. JSON
   13. PDF
   14. Snowflake
   15. MySQL database
   16. Oracle database
   17. Access database
   18. Azure SQL Database
   19. Google Sheets

20. Python script