**Power BI assignment 2**

**Ans.1**

A natural language query is input that consists solely of terms or phrases spoken normally or entered as they might be spoken, without any non-language characters, such as the plus symbol or the asterisk, and without any special format or alteration of syntax.

Advantages of Natural Queries :-

1. NLP system offers exact answers to the questions, no unnecessary or unwanted some information.
2. The accuracy of the answer increases with the amount of relevant information provided in the questions.
3. Structuring a high unstructured data source.
4. Users can ask questions about any subject and get a direct response in seconds.
5. It is easy to implement.
6. Using a program is less costly than hiring a person. A person can take two or three times longer than a machine to execute the tasks mentioned.
7. NLP system provides answers to the questions in natural language.
8. Allow you to perform more language-based data compares to a human being without fatigue and in an unbiased and consistent way.
9. NLP process help computer communicate with a human in their language and scales other language-related tasks.
10. It is a faster customer service response time.

**Ans.2**

Power BI can connect to multiple different data sources, combine and shape data from those connections, then create reports and dashboards to share with others. The Power BI service is built on Azure. The Power BI service architecture is based on two clusters:

* The Web Front End (WFE) cluster and
* The Back-End cluster

Clients and the back end are connected by the front end, commonly known as the web front-end cluster. The front-end services 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.

To authenticate customers and provide tokens for subsequent Power BI customer connections, the WFE cluster manages the original Power BI link and authentication mechanism using AAD. The Azure Traffic Manager (ATM) is also used by Power BI to direct customer traffic to the nearest datacenter, which is determined by the DNS record of the client attempting to connect, authenticate and download static content and files. Power BI effectively distributes the appropriate static content and files to customers based on geographical location, using the Azure Content Delivery Network (CDN).

 Front end cluster acts as an intermediate between the back end cluster and the clients. It is also called a Web Front End Cluster. It establishes the initial connection and authenticates the users or clients using the Azure Active Directory. After user authentication, Azure Traffic Manager directs the user requests to the nearest data centers and Azure Content Delivery Network (CDN) allocates the statice files/content to the users or clients based on the geographical locations.

**Ans.3**

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 Back-End cluster is how authenticated clients interact with the Power BI service. Visualization, user dashboards, datasets, reports, data storage, information links, information refresh, and other Power BI service interaction elements are managed by the Back-End cluster. The Role Gateway works as a gateway between the demands of clients and the Power BI service. Users do not directly communicate with positions other than the gateway's role. Azure API Management will eventually manage the gateway role.

It manages the datasets, reports, storage, visualizations, data refreshing, data connections, and other services in the Power BI. At the back-end cluster, the web client has only two direct points to interact with the data, i.e., Gateway Role and Azure API Management. These two components are responsible for authorizing, load balancing, routing, authentication, etc.

**Ans.5**

Power BI and Excel have many similarities in terms of functionalities and how the data is presented or how we make the connection with the other data sources. Excel is much easier to use than Power BI, but Power BI has a certain upper hand, like better visualization. We should also remember that Excel is very limited to sharing reports which Power BI overcomes.

Comparing MS Excel and Power BI in terms of following :-

Data Import:

* Power BI, you can extract data from virtually anywhere – any application, platform, or software. This gives Power BI users access to a massive range of data sources. Usually, this is done using Power BI desktop.
* Excel can connect and use data from a huge range of different sources, but Power BI is still more intuitive when it comes to getting this kind of information into your reports and dashboards quickly!

Data Transformation:

* In PowerBI , Power Query Editor can be used to edit or *transform* data files before they get loaded into the Power BI dashboard. The Query Editor serves as an intermediate data container that allows you to modify data by choosing columns and rows, pivoting and unpivoting columns, splitting columns and rows, etc.
* With Power Query (known as Get & Transform in Excel), you can import or connect to external data, and then shape that data, for example remove a column, change a data type, or merge tables, in ways that meet your needs. Then, you can load your query into Excel to create charts and reports. Periodically, you can refresh the data to make it up to date. Power Query is available on three Excel applications, Excel for Windows, Excel for Mac and Excel for the Web.

Modelling :

* in Power BI, the only option for data modeling and calculations is to use data analysis expressions (DAX). This is a library encompassing functions and operations that can be used for building expressions and formulas. In Microsoft Excel reports you can operate both DAX and standard Excel formulas, which is easier for people not acquainted with DAX.
* *Power BI* can cope with very complex modelling if you’re looking to build a complex data model, whereas *Excel* is not made for these purposes. Power BI Desktop offers users the ability to perform modelling with ease using drag and drop features and advanced filters, which can’t be done in excel!

Reporting:

* Power BI can handle multiple data sources, it makes your reports much more customizable. For example, if you wanted to change the color scheme of a Power BI report or add custom visuals like maps or gauges which aren’t available in Excel.
* Intuitive report sharing is built into Power BI. As we’ve mentioned, reports can be viewed across multiple devices, and Power BI makes it easy to share reports with your team members, even if they don’t have Power BI themselves.

* In Excel, Simple and less attractive reports than those of power bi as it provides more beautiful, personalized ,attractive and interactive reports.

Server Development:

* Power BI Report Server is an on-premises report server with a web portal in which you display and manage reports and KPIs and it is also a collection of software services, apps, and connectors that work together to turn your unrelated sources of data into coherent, visually immersive, and interactive insights.

Cost :

* 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.
* Since we already have Excel, we need to spend additional money to procure this and build dashboards but it comes at a flat rate of $135 if you buy a standalone version or $6.99/mo if it is a part of Office 365 Suite.

Convert Models :

* Excel uses the MDX language, which is challenging to work with and Power BI’s better functionality makes it a more logical choice for those who want power features without learning complex coding languages.
* Power BI uses the DAX (Data Analysis Expressions) language, which is easier to use than MDX used by Microsoft Excel. You can customize datasets and add calculations yourself by using DAX in Power BI.

**Ans.6**

**Power BI Desktop** is a free application that can be downloaded and installed on your local computer. Power BI Desktop is a comprehensive data analysis and report creation tool for connecting to, transforming, visualizing, and analyzing your data. It includes the Query Editor, which allows you to connect to a variety of data sources and combine them (also known as modelling) into a data model.  Then, based on that data model, you can design a report. Reports can be shared directly with others or by publishing to the Power BI service.

With Power BI Desktop, you can connect to data from many different sources. For a full list of available data sources.

You connect to data by using the *Home* ribbon. To show the most common data types menu, select the Get data button label or the down arrow.

* SQL Server database
* Access database
* SQL Server Analysis Services database
* Oracle database
* IBM Db2 database
* IBM Informix database (Beta)
* IBM Netezza
* MySQL database
* PostgreSQL database
* Sybase database
* Teradata database
* SAP HANA database
* SAP Business Warehouse Application Server
* SAP Business Warehouse Message Server
* Amazon Redshift
* Impala
* Google BigQuery
* Google BigQuery (Azure AD)(Beta)
* Vertica
* Snowflake