

# DATA SCIENCE CBSE AI - 417

# **Q&A of Data Science**

#### 1. What is data Science ?

Ans. Data Science is a field that uses scientific methods, processes, algorithms and systems to extract knowledge and insights from many structural and unstructured data to apply in Al applications. It combines concepts and methods from various fields of statistics, mathematics, data analysis, machine learning, computer science and so forth. Data Science uses data analytics to analyse and gather insights from past data.

#### 2. What is targeted advertising?

Ans. Targeted advertising is a form of advertising, including online advertising, that is directed towards an audience with certain traits, based on the product or person the advertiser is promoting. It makes uses of past data about the needs and choices of the user and picks products and time for advertising the product accordingly.

#### 3. What is Recommender System?

Ans. A Recommender System refers to a system that is capable of predicting the future preference of a set of items for a user and recommending the top item. Recommender systems help the retailers/ sellers and the users by suggesting items similar to the ones a person likes or by suggesting items liked by people who are similar to the user.

#### 4. How has data science impacted the healthcare field?

Ans. Data science provides practical insights and aid in the crucial decision-making concerning healthcare. Data-driven decision-making opens up new possibilities to boost healthcare quality. Data science has improved the healthcare in various ways, such as:

- Improving diagnostic accuracy and efficiency
- Turning patient care into precision medicine
- Advancing pharmaceutical research to find cure
- Reducing hospital readmissions by suggesting preventive care

And many more

#### 5. What is the role of data science in the Internet Search?

Ans. Internet involves huge volumes of data saved across servers and connected devices. To search in this huge amount of data, data science tools are really beneficial as they provide precise results in a fraction of the time. For example, search engines like Google make use of data science tools and algorithms to search for the asked query across the Internet, in a fraction of a second.

6. What are different steps followed for developing an AI based data science project? Ans. Like any other AI project, a data science project also undergoes the phases of Al project cycle where each phase is data-centric.

(i) After collecting data for a data science project, data is first cleaned, standardized, and the missing data is handled.

(ii) Then the data is analyzed and visualized to know about the trends and key characteristics of data.

(iii) Next the model is trained using the training dataset and evaluated using the testing dataset

#### 7. How is data used for data modelling in a data science project?

Ans. For data modelling, the treated dataset is divided into a training dataset and a testing dataset. The AI-based model is trained using the training dataset using one of the training techniques supervised/unsupervised or reinforced learning. Later, the testing dataset is used to test and evaluate the developed AI model.

#### 8. How does model evaluation take place for a data science project?

Ans. For model evaluation, the testing dataset is used and the predicted values are compared with the actual results to determine the efficacy and efficiency of the model developed and trained. More the predicted values are closer to actual values, more efficient the model is.

#### 9. List some data formats used in data science projects.

Ans. There are many data types and formats used in data science projects such as CSV, XLSX, spreadsheets, SQL, XML, JSON etc.

#### 10. List some sources of acquiring data.

Ans. Survey, Questionnaire, Open-sourced Government Portals, and statistical sites, records and documents, etc.

#### 11. What are NumPy arrays?

Ans. A NumPy array is a table of elements (usually numbers), all of the same type, indexed by a tuple of integers.

NumPy arrays are also called ndarrays. The ndarrays can be 1-dimensional, 2-dimensional and multi-dimensional.

12. What is an array and how is it different from a list? What is the name of the built-in array class in NumPy?

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#### 13- What are the differences between numpy arrays and lists ?

Python Lists	Numpy Arrays
The list can be homogeneous or heterogeneous, i.e., all the elements can be of same or different types.	The Numpy arrays are homogenous, i.e., all the elements are of same types.
Element wise operations are not possible on the list.	Element wise operations are possible on the ndarrays.
Elements of a list need not be contiguous in memory.	Numpy array elements are stored in contiguous memory
List is a core data type of Python. It is part of the Python and no separate library is needed to use it.	Ndarrays are not part of core Python. In order to use them, we need to install Numpy library.

Built in class of Numpy array is called ndarray.

#### 14. Name the two data structures of Pandas library.

Ans. Series, DataFrame

### 15. What is data visualization?

Ans. Data visualization is the graphical representation of information and data. By using visual elements like charts, graphs, and maps, data visualization tools provide an accessible way to see and understand trends, outliers, and patterns in data.

# 16. Which Python library is used for data visualization?

Ans. Matplotlib

## **15. What is the KNN model?**

Ans. K-nearest neighbours is a simple, supervised learning algorithm used mainly for classification and regression problems. KNN algorithm stores all available cases (labelled data points) and classifies new-cases (query points) based on a similarity measure (e.g., distance functions).

# **16. List some applications of the KNN model.**

- Ans. Some applications of KNN are:
- ✓ Forecasting stock market;
- ✓ Currency exchange rate;
- ✓ Bank bankruptcies;
- ✓ Understanding and managing financial risk;
- ✓ Trading futures;
- ✓ Credit rating: Loan management;
- ✓ Bank customer profiling;
- ✓ Money laundering analyses.