1.Define Artificial Intelligensce (AI) and provide examples of its applications.

Ans: Artifical intelligence (AI) is a field of computer science that seeks to create systems and programmes capable of endowing a machine with human abilities .

Appilcations:virtual assistance like alexa siri,online reccomandations,fraud detection etc…

2.Differentiate between supervised and unsupervised learning techniques in ML.

|  | **Supervised Learning** | **Unsupervised Learning** | |
| --- | --- | --- | --- |
| **Input Data** | Uses Known and Labeled Data as input | Uses Unknown Data as input |
| **Computational Complexity** | Less Computational Complexity | More Computational Complex |
| **Real-Time** | Uses off-line analysis | Uses Real-Time Analysis of Data |
| **Number of Classes** | The number of Classes is known | The number of Classes is not known |
| **Accuracy of Results** | Accurate and Reliable Results | Moderate Accurate and Reliable Results |
| **Output data** | The desired output is given. | The desired, output is not given. |
| **Model** | In supervised learning it is not possible to learn larger and more complex models than in unsupervised learning | In unsupervised learning it is possible to learn larger and more complex models than in supervised learning |
| **Training data** | In supervised learning training data is used to infer model | In unsupervised learning training data is not used. |
| **Another name** | Supervised learning is also called classification. | Unsupervised learning is also called clustering. |
| **Test of model** | We can test our model. | We can not test our model. |
| **Example** | Optical Character Recognition | Find a face in an image. |

3.What is Python? Discuss its main features and advantages.

Python is an interpreted, object-oriented, high-level programming language with dynamic semantics developed by Guido van Rossum. It was originally released in 1991. Designed to be easy as well as fun, the name "Python" is a nod to the British comedy group Monty Python.

Features:

* Easy to Code. Python is a very high-level programming language, yet it is effortless to learn
* Easy to Read
* Free and Open-Source
* Robust Standard Library
* Interpreted
* Portable
* Object-Oriented and Procedure-Oriented
* Extensible

Advantages:

* Easy to Read, Learn and Write.
* Improved Productivity.
* Interpreted Language.
* Dynamically Typed.
* Free and Open-Source.
* Vast Libraries Support.
* Portability.

4.What are the advantages of using Python as a programming language for AI and ML?

. The ability to quickly analyze large amounts of data to produce actionable insights.

. Increased return on investment (ROI) for associated services due to decrease labor costs.

5.Discuss the importance of indentation in Python code.

The primary purpose of indentation in Python is to define the scope of statements, such as those within loops, conditionals, functions, and classes. Consistent and proper indentation is crucial for the interpreter to understand the logical structure of the code.

6.Define a variable in Python. Provide examples of valid variable names.

A variable can have a short name (like x and y) or a more descriptive name (age, carname, total\_volume). Rules for Python variables: A variable name must start with a letter or the underscore character. A variable name cannot start with a number.

7.Explain the difference between a keyword and an identifier in Python.

A keyword refers to a predefined word that python reserves for working programs that have a specific meaning, You can't use a keyword anywhere else. Python Identifiers are the different values that a programmer can use to define various variables, integers, functions, and classes.

8.List the basic data types available in Python.

* Numeric data types: int, float, complex.
* String data types: str.
* Sequence types: list, tuple, range.
* Binary types: bytes, bytearray, memoryview.
* Mapping data type: dict.
* Boolean type: bool.
* Set data types: set, frozenset.

9.Describe the syntax for an if statement in Python.

if condition: statement1 statement2 # Here if the condition is true, if block # will consider only statement1 to be inside # its block.

10.Explain the purpose of the elif statement in Python.

The “elif” keyword in Python, stands for “else if”. It can be used in conditional statements to check for multiple conditions. For example, if the first condition is false, it moves on to the next “elif” statement to check if that condition is true.