SMART BRIDGE ASSIGNMENT-1

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

Artificial Intelligence is composed of two words **Artificial** and **Intelligence**, where Artificial defines "*man-made,*" and intelligence defines "*thinking power*", hence AI means "*a man-made thinking power.*"

So, we can define AI as:

> "It is a branch of computer science by which we can create intelligent machines which can behave like a human, think like humans, and able to make decisions."

Artificial Intelligence exists when a machine can have human based skills such as learning, reasoning, and solving problems

With Artificial Intelligence you do not need to preprogram a machine to do some work, despite that you can create a machine with programmed algorithms which can work with own intelligence, and that is the awesomeness of AI.

It is believed that AI is not a new technology, and some people says that as per Greek myth, there were Mechanical men in early days which can work and behave like humans

Some of the examples of AI applications:

- **Personalized Online Shopping**
- **Smart Cars**
- **Marketing**
- **Enhanced Images**
- **Social Media**
- **Surveillance**
- **Agriculture**
- **Customer Service**
- **Video Games**
- **Healthcare**
- **Banks**
- **Smart Homes**
- **Virtual Assistance**
- **Space Exploration**
- **Chatbots**

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

Supervised and unsupervised learning are both machine learning techniques that differ in how they use data

SUPERVISED LEARNING:

Uses labeled input and output data to train algorithms to predict outcomes and recognize patterns .for example, a supervised model can predict flight times based on weather ,airport, traffic, and peak flight hours .supervised learning models are more accurate than unsupervised models ,but require human intervention to label data.

UNSUPERVISED LEARNING:

Uses unlabeled data to discover patterns and insights without human supervision .For example, unsupervised learning can identify group of buyers who purchase related products together, and suggest other items to recommend to similar customers .Unsupervised learning techniques include dimensionality reduction , clustering, and association rule learning.

3.What is python ? discuss its main features and advantages.

Python is general-purpose, high-level programming language that is easy to learn and use.it is dynamically typed ,meaning that you do not need to declare the data types of variables .python is also interpreted ,meaning that code is executed directly by the interpreter without being complied into machine code.

Python features and advantages:

- Easy to read: python code looks like simple English words.
- Free and open source.
- Robust Standard libraries.
- Easy to code: Python is a very high -level programming languages ,yet it is effortless to learn.
- Portable.
- Object-oriented and procedure-oriented.

- Extensible.

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

As a coding language , python offers many advantages to its users. Those advantages translate into making it one of the best ,most powerful , and popular programming language for AI and ML.

GREAT LIBRARIES:

Python has most popular in AI and ML for its vast library ecosystem. This becomes especially valuable in ML ,where continuous data processing is essential to functionality.

Some popular AI and ML libraries are:

- Numpy.
- Scipy.
- Theano.
- pandas.
- PyBrain

FLEXIBLE:

Python empowers developers to choose from various programming styles based on their specific needs. It offers developers the freedom to choose between object-oriented(oop) and scripting.

READABLE:

Python code is easily understood, modified, and copied. Even when joining on ongoing project, developers can quickly grasp what's going on .python offers optimization capabilities for testing ,debugging, and streamlining the development.

SCALABILITY:

Python is simple enough to build an AI and ML platform on a small scale then make it bigger and more complex as the need arises.

VERSATILE & PLATFORM INDEPENDENT:

The term "platform independent "refers to a programming language or framework that allows developers to implement things on one machine and use them on other device without any modifications.

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5.Discuss the importance of indentation in python code .

Indentation is very important in python because it is used to define the structure and scope of code blocks .Unlike other programming languages ,python does not use curly braces or keywords to group statements together .Instead ,it uses indentation .This makes python code more readable and maintainable. This can also help to catch errors early on .Before they cause problems.

6. Define a variable in python .provide examples of valid variable names.

A python variable is a reserved memory location to store values . In other words, a variable in a python program gives data to the computer for processing.

Every value in python has a datatype .Different data types in python are Numbers ,List, Tuples, Strings, Dictionary ,etc. Variables can be declared by any name or even alphabets like a, aa, ab, abb , etc.

Examples of valid variables in python are:

name='shivani', age=19, course='CSD' , etc.

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

Keyword: Are words that have a special meaning to the python interpreter. They cannot be used as variable names ,function names ,or class names. There are 33 keywords in python.

Examples: False, import, else, pass, break.

Identifier:

Are names that we give to a variables, functions and classes. They can be any sequence of letters, numbers, and underscores. But they cannot start with a number.

Examples: my_variable , my_class ,my_function.

It is important to note that keywords and identifiers are case sensitive . This means that my_class is different identifier than My_class.

8.List the basic datatypes available in python.

Python has several built-in datatypes .

Text Type: str

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Stores any sequence of characters.

Numeric Types: int, float , complex

- Int: stores whole numbers.
- Float: stores decimal numbers.
- Complex: stores complex numbers.

Sequence Types: List, Tuples, range

- List: stores an ordered collection of items .Lists can be changed ,meaning that can be added , removed, or changed.
- Tuple: stores an ordered collection of items. Tuples are immutable , meaning they cannot be changed, removed and added.
- Range: stores a sequence of numbers .ranges are immutable.

Boolean type:

Stores a Boolean value, either True or false.

Binary Types: bytes, byte array, memory view .

- Bytes: stores a sequence of bytes .bytes are immutable.
- Byte array: stores a mutable sequence of bytes.
- Memory view: stores a memory view of an object .Memory views are mutable.

Set: sets can be created by using the built -in set() function with an iterable object or a sequence by placing the sequence of inside curly braces, separated by a 'comma'. Various mixed -up data type values can be also passed to the set.

Dictionary: A dictionary in python is an unordered collection of data values, used to store data values like a map, unlike other values in python datatypes that hold a single value as an element, a dictionary holds a key: value pair.

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

Syntax for if statement:

```
Num=2

If num>0:

    Print("num is positive")

Print("above syntax  is demo of if statement ")
```

10.explain the purpose of the elif statement in python.

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'Elif' stands for 'else if' is used in python programming to test multiple conditions. It is python way of saying "if the previous condition is not true, then try this condition".