ASSIGNMENT-1

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

Ans: Artificial intelligence is the science of machines that can mimic human thinking abilities. Unlike humans AI technology can process large amounts of data. The main goal for AI is to be able to recognize patterns, make judgements and take decisions like humans.

Many advanced AI models are self-learning models, so they improve their decision making skills and generative skills overtime. The AI models that have the ability to generate text, audio, images, video etc are called as Generative AI.

Examples for AI:

Chatbots

Autocorrect system

Recommendation algorithms

Voice Assistants

Large Language Models (LLM)

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

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| **Supervised learning** | **Unsupervised learning** |
| 1.It uses labeled data as an Input | 1.It uses unknown data as input |
| 2.it finds the relationship between input and desired output. | 2.it doesn’t have any instructions about the input. |
| 3.The algorithm produces precise predictions and classifications. | 3.The algorithm finds out the patterns and structures in the given dataset. |
| 4.It is hard to learn larger and complex datasets. | 4.It is possible to learn larger and complex datasets. |
| 5.Techniques like Regression and Classification are involved. | 5.Techniques like Clustering and Association are involved. |

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

Python is an easy to learn high-level programming language. Python is a very flexible and straight-forward programming language, Python is a very versatile language so, we can bulid simple programs to more complex softwares. Python is both Sequentiall and Object Oriented so, it supports all the features of OOPs such as abstracrion, encapsulation, polymorphisim etc. Python is Interpreted therefore, the program can run faster by saving time and be efficient in giving the output.

Features of Python:

Open source

High-level

Object Oriented

Interpreted

Easy to use

Dynamic

Database supported

Advantages of Python:

Easy to learn

Free of cost

Open source

Intergrated with other languages

Code reliability

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

The advantages of using python in AI and ML are as follows

1.Python has huge and efficient libraries such as Pandas, Numpy, TensorFlow, Keras etc

2. Python programming language has a simple syntax that resembles the everyday English language.

3.Python is a very Flexible language which is a very good feature for Machine Learning

4. Python allows the developer to choose the programming style they are fully comfortable with.

5. python is a platform independent language, which means it is convenient for the developer.

6. Python is not only easy for the developer but also easy to read and understand.

5. Discuss the importance of indentation in Python code.

In Python indentation is used to indicate the beginning or ending of a block of code.

Indentation helps indicate the scope of a loop or functions or classes. Indentation is basically the spaces given either at the beginning or the end of a code block in python.

In other programming languages indentation is only for readability but in python indentation is very important.

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

Variables in Python are used to store values. Variables are used as reserved memory location. There are some rules to defining a variable name in python

* Variable must start with a letter or underscore
* Variable cannot start with a number.
* Variable names are case sensitive eg: age and AGE are different variables
* Variable cannot be any python keywords

Example:

Var, \_var, var, VAR, var1 etc are few variable names.

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

Python keywords are predefined words that have some special meaning.

All the keywords in python are used in lowercase except True and False.

Keywords are used to define the syntax of the code

Python cannot be used as identifiers.

Identifiers are used as the general terminology for naming variables functions and arrays.

Digits must start with underscore or a character.

Identifiers are case sensitive.

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| **KEYWORDS** | **IDENTIFIERS** |
| 1.Keywords are predefined. | 1.Identifiers are used to define different values |
| 2.It specifies the type of the value | 2.Identifies the names of a value. |
| 3.eg: int, char, if , while etc.. | 3. var, count, temp etc.. |

1. List the basic data types available in Python.

Following are the basic datatypes used in Python:

Integer (int):

int is used to define an integer value(numeric value) , contains both positive and negative numbers. There is no limit to how long an integer value can be.

Float (float):

A number with floating point representation. It is specified by a decimal point.

Complex :

A complex number can me specified as (real part) + (imaginary part) j.

Strings:

String is a collection of one ore more characters.we can represent using single quote, double quote or a triple quote.

List:

List is an ordered collection of data.items inside the list donot need to be the same datatype. List is mutable.

Tuple:

Tuple is also an ordered collection of data. Tuple is immutable(cannot be modified after creation).

Boolean:

Only contains two values True(1) and False(0).

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

A simple if statement is a conditional statement. The syntax for an if statement goes as follows:

if (condition):

statement;

the space after the condition indicated the indentation.

Eg:

a=10

if(a>0):

print(“hello”)

output: hello

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

elif statement in Python is also a conditional statement. We use elif when there are two or more conditions regarding the same scenario.

Eg:

a=20  
b=43

if b>a:  
  print(“b is greater than a”)

elif a==b:  
  print(“b is equal to a”)