Assignment

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

A: Artificial Intelligence is the process of creating machines that can learn, reason and act autonomously. AI is also used to develop efficient techniques for solving a wide range of problems.

There are so many real life applications of Artificial Intelligence like:

* AI Voice assistances like Siri and Alexa.
* AI is also used in automating many parts of machinery in Industries.
* There are different types of generative AI’s like ChatGPT and Gemini.

1. Differentiate between Supervised and Unsupervised learning techniques in ML.

A: these are the few Differences between Supervised and Unsupervised Learning Techniques in ML.

|  |  |
| --- | --- |
| Supervised learning   * Algorithms are trained using labeled data. * Simpler method. * Highly Accurate. * Needs Supervision to train the model. * Uses Offline Analysis. * Uses training data to infer model. * Supervised learning is also known as Classification. * Example: Optical character recognition. | Unsupervised learning   * Algorithms are used against unlabeled data. * Computationally Complex. * Less Accuracy. * There is no need of any Supervision to train the model. * Uses Real-time analysis of data. * No training data is used. * Unsupervised learning is also called as Clustering. * Example: Finding a face in an Image. |

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

A: Python is widely used, popular and versatile High-level programming Language. Python’s clear syntax and numerous learning resources make it an excellent language.

Features and Advantages of Python:

* Easy to learn and Read.
* Free and Open source.
* High level language.
* Object Oriented programming (OOP) language.
* Dynamically Typed language.
* Portable Language.
* Large Standard Library.
* Integrated language.
* GUI programming support.

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

A: **Python is the major code language for AI and ML. It surpasses Java in popularity and has many advantages, such as a great library ecosystem, Good visualization options, A low entry barrier, Community support, Flexibility, Readability, and Platform independence.**There are many reasons why Python is the preferred language in artificial intelligence and machine learning

* Huge number of libraries and frameworks
* Easy syntax and resembles the English language
* No need to recompile source code
* Platform-independent
* Great community support
* Readability
* **Java**
* **JavaScript**

1. Define the importance of indentation in Python code.

A: **Indentation plays a crucial role in Python programming. It is a unique feature of the language that sets it apart from other programming languages. In Python, indentation is used to define the structure and hierarchy of the code. It helps in visually organizing the code and making it more readable.**

indentation refers to adding white space before a statement to a particular block of code. In another word, all the statements with the same space to the right, belong to the same code block. Indentation is a very important concept of Python because without properly indenting the Python code, you will end up seeing IndentationError and the code will not get compiled.

1. Discuss a variable in Python. Provide examples of valid variable names.

A:Python Variable is containers that store values. Python is not “statically typed”. We do not need to declare variables before using them or declare their type. A variable is created the moment we first assign a value to it. A Python variable is a name given to a memory location. It is the basic unit of storage in a program.

Myvar = “green”

My\_var = “blue”

\_my\_var = “orange”

myVar = “red”

MYVAR = “black”

Myvar2 = “white”

Rules for Variable Names:

You may use uppercase letters for variable names but it is always perfectly fine to begin variable names with a lowercase letter. If your Variable name is long, then you can use underscore character (\_) in the name. For example, top\_five\_members, var\_1 etc. all are valid example

Technically, the variable acts as an address for where the data is stored in memory. A Python variable may be assigned a value of one type and then later re-assigned a value of a different type. For example, x = "apples" can later be x = 5

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

A:Python Keywords are some predefined and reserved words in Python that have special meanings. Keywords are used to define the syntax of the coding. The keyword cannot be used as an identifier, function, or variable name. All the keywords in Python are written in lowercase except True and False. There are 35 keywords in Python.In Python, there is an inbuilt keyword module that provides an iskeyword() function that can be used to check whether a given string is a valid keyword or not.

Identifier is a user-defined name given to a variable, function, class, module, etc. The identifier is a combination of character digits and an underscore. They are case-sensitive i.e., ‘num’ and ‘Num’ and ‘NUM’ are three different identifiers in python. It is a good programming practice to give meaningful names to identifiers to make the code understandable.We can also use the Python string isidentifier() method to check whether a string is a valid identifier or not.

Python Identifier is the name we give to identify a variable, function, class, module or other object. That means whenever we want to give an entity a name, that's called identifier. A python identifier is a name given to various entities like variables, functions, and classes.

1. List the basic data types available in Python.

A: **Python Data Types are used to define the type of a variable. In this article, we’ll list out all the data types and discussion the functionality of each. If you are starting out in Python, don’t forget to first visit the Python tutorial for beginners.**Python Data types are the classification orcategorization of data items. It represents the kind of value that tells what operations can be performed on a particular data. Since everything is an object in Python programming, Python data types are classes and variables are instances (objects) of these classes. The following are the standard or built-in data types in Python.

Some built-in Python data types are:

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

* Numeric
* Sequence Type
* Boolean
* Set
* Dictionary
* Binary Types

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

A: In Python, if statements are a starting point to implement a condition. Let’s look at the simplest example

If <condition>:

<expression>

When <condition> is evaluated by Python, it’ll become either True or False (Booleans). Thus, if the condition is True (i.e, it is met), the <expression> will be executed, but if <condition> is False (i.e., it is not met), the <expression> won’t be executed.

We are pretty free to decide what conditions and expressions can be because Python is very flexible.

Let’s look at a concrete example.

X=1

Y=3

If x < y

Print(“x is smaller than y”)

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

A: The elif keyword is pythons way of saying "if the previous conditions were not true, then try this condition".

a = 33  
b = 33  
if b > a:  
  print("b is greater than a")  
elif a == b:  
  print("a and b are equal")