

Assignment -1

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

* Artificial Intelligence (AI) is the branch of computer science focused on creating intelligent machines capable of performing tasks that typically require human intelligence.

* These tasks include learning, reasoning, problem-solving, perception, and language understanding.

* AI systems aim to simulate human cognitive functions and exhibit behaviors associated with human intelligence.

* AI applications span various domains and industries, revolutionizing how we live, work and interact with technology. Some examples are :

1. Virtual Assistants.

2. Recommendation Systems:

3. Autonomous vehicles

4. Healthcare.

5. Finance.

6. Manufacturing and Robotics.

7. Natural language processing (NLP).

8. Gaming

9. smart Home devices.

2) Differentiate between supervised learning techniques in ML.

supervised

unsupervised.

- * supervised learning is to learn a mapping function from input features to output labels.
- * unsupervised learning aims to discover hidden patterns or structures within the data without explicit guidance.
- * uses training dataset.
- * uses input dataset.
- * data is classified based on training dataset.
- * uses properties of given data to classify it.
- * used for prediction.
- * used for Analysis.
- * divided into two types Regression & Classification.
- * divided into two types clustering & Association.
- * known number of classes.
- * unknown number of classes.
- * use offline analysis of data.
- * use real time analysis of data.

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

A: Python is a high-level, interpreted programming language known for its simplicity and readability. Its main features include:

1. Readable and simple syntax: Python's syntax is designed to be readable and intuitive. It uses English keywords frequently, making it easy to understand and write code.
 2. Interpreted and dynamic: Python code is executed line by line, allowing for rapid development and debugging. It's dynamically typed, meaning you don't need to declare variables explicitly, although you can if you want to.
 3. Platform independent: Python code can run on various operating systems like Windows, macOS and Linux without any modification.
 4. Integration capability: Python can easily integrate with other languages like C, C++, Java, allowing you to leverage existing code & libraries.
- ### Advantages of Python:
1. Productivity
 2. Flexibility
 3. Community and Ecosystem
 4. Scalability
 5. Interoperability

4. what are the advantages of using Python as a programming language for AI and ML?
 As python is favored for

reasons:

1. Ease of learning and use: Python's syntax is easy to understand and read, making it accessible for beginners and experienced developers alike.

2. Large Ecosystem:

Python has a vast ecosystem of libraries and frameworks specifically designed for AI and ML, such as TensorFlow, PyTorch, and scikit-learn.

3. Community support:

There's a large and active community of developers contributing to Python's AI and ML libraries, providing support, tutorials, and resources.

4. Flexibility:

Python is a versatile language that can be used for a wide range of tasks beyond AI and ML, such as web development, scripting, and automation.

5. Performance:

While Python may not be as fast as lower-level languages like C or C++, its performance can be optimized using libraries like NumPy and Cython.

5. Discuss the importance of indentation in python code.

Indentation in Python code plays a fundamental role in maintaining readability, clarity, and consistency within the codebase. While it is often seen as a stylistic preference, its importance extends beyond mere stylistic preferences as it directly influences the structure, logic and functionality of Python programs.

Here are several key aspects highlighting the significance of indentation in Python:

1. Readability: Python emphasizes readability and clean code, and indentation significantly contributes to achieving this goal.

2. Code Structure: In Python, code blocks are defined by their indentation level. Indentation determines which lines of code belong to a specific block.

3. Consistency: Python enforces consistent indentation as part of its syntax. By requiring a consistent indentation style, Python promotes code uniformity & readability across different projects.

4. Debugging: Properly indented code is easier to debug. When encountering an error, developers can quickly pinpoint the location of the issue based on the independent indentation level.

Q. Define a variable in python? provide example

In python, variable is a name that refers to a value stored in memory. A variable can be defined by assigning a value to it using the equal sign (=).

e.g. `variable_name = value.`

* Here is an example of valid variable names in python:

`age = 25`

`name = "John"`

`salary - 2024 = 50000`

`is_student = True`

* Valid variable names can consist of letters (both uppercase and lowercase), digits, and underscores (_). But they must start with a letter or an underscore.

* Additionally, variable names are case-sensitive.

meaning "age" and "Age" are treated as different variables.

Q. Explain the difference between keyword and an identifier in python.

Ans - Keywords

Identifiers

* Key words are reserved identifiers. It is a unique word with specific meaning given to the class function array etc.

Just go on.

- * keywords do not have symbol
- * identifiers can have (p symbols)
- * specify the type / kind of entity.
- * identifiers can identify the name of a particular entity.
- * keywords are not further classified.
- * identifiers are classified into "external name" or "internal name".

Q. List the basic data types available in python.

Integer (int)

Represents whole numbers; both positive & negative for example: 5, -10, 0

Float:

Represents decimal numbers.

ex: 3.14, 5.66, 0.536

String (str): A sequence of characters enclosed in single quotes (' ') or double quotes (" ")

e.g. "Hello", "python", "Java", "words"

Boolean (bool):

Represents either True or False. This data type is useful for logical operations & conditional statements.

List:

Represents an ordered collection of elements enclosed in square brackets ([]) enclosed in square brackets ([]) listing

ex: [1, 2, 3], ['apple', 'banana', 'grape']

(a) Describe the syntax for an if statement in python.

In python, the syntax for an if statement is:

```
if condition1:  
    # code block to execute if condition1 is True
```

if condition1:

code block to execute if condition1 is True

elif condition2: # code block to execute if condition2 is True
 # code block to execute if condition2 is True

else:

code block to execute if none of the conditions are True

Each condition is followed by (:) and the code block associated with each condition is indented.

10. Explain the purpose of the else statement in python.

The else statement in python stands for "else if". It's used in conditional statements to check for multiple conditions after an initial 'if' statement.

[Page, serial: 1990] [8, 8, 1] 12

- * If the condition in 'if' statement is false, python checks the conditions in subsequent 'elif' statements until one is true or it reaches an 'else' statement.
- * It allows for branching logic, enabling the program to execute different code blocks based on different conditions.

if condition1 :

 # code block to be executed
 if condition1 is True.

elif condition2 :

 # code block to be executed *
 if condition2 is True.

else

 # code block to be executed if
 all conditions are false.