

Assignment-1

1) Define Artificial intelligence (AI) & provide example of its applications

* Artificial intelligence, or AI is the field of computer science that focuses on creating intelligent machines.

* These machines are designed to perform tasks that would typically require human intelligence, such as problem-solving learning & decision making.

* AI technology has applications in various areas, like voice assistants, self-driving cars & even social media algorithms.

Examples of its applications

1) Virtual Assistants

AI powers voice-activated assistants like Siri, Alexa, & Google Assistant help us with tasks, answer questions, & provide information.

2) Autonomous Vehicles.

AI enables self-driving cars to perceive their surroundings, make decisions & navigate safely on the road.

3) Health care

AI is used in medical imaging to assist in the diagnosis of diseases, drug discovery & personalized medicine

4) Gaming

AI is used to create intelligent virtual opponents in games & to improve game graphics & physics simulations

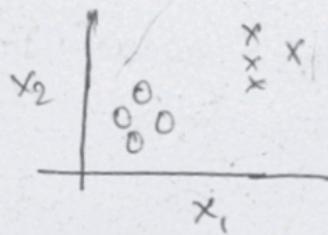
5) Smart Home Devices:

AI powers devices like smart speakers, thermostats, & security systems making our homes more efficient & responsive.

→ Differentiate between supervised & unsupervised learning techniques in ML.

Supervised

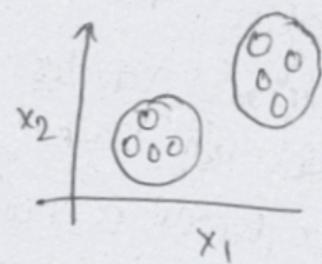
- * Input data is labelled
- * Uses training dataset
- * Data is classified based on training dataset
- * Used for prediction
- * Divided into two types Regression & classification
- * Known number of classes



- * Use offline analysis of data

Unsupervised

- * Input data is unlabeled
- * Uses just input data
- * Uses properties of given data to classify it
- * Used for analysis
- * Divided into two types clustering & association
- * Unknown number of classes



- * Use real time analysis of data

3, what is python? Discuss its main features & advantages.

python is a programming language that's super popular for its simplicity & versatility. It's used for web development, data analysis, AI & more.

1, easy to Read & write

python has a clean & simple syntax, making it easy to understand & write code.

2) versatile & powerful: python can be used for various purposes like web development, data analysis, scientific computing, machine learning & more.

3) large standard library:

python comes with a vast standard library that provides ready-to-use modules for different tasks saving you time & effort.

4) cross-platform compatibility

python programs can run on different operating systems like windows, macOS, & Linux without any modifications.

5) integration capabilities

python can easily integrate with other languages like C, C++, & Java, allowing you to leverage existing code & libraries.

4) what are the advantages of using python as a programming language for AI&ML?

Python is widely used in the field of AI&ML for several reasons.

1, Extensive libraries

Python offers a rich ecosystem of libraries such as TensorFlow, PyTorch & scikit-learn, which provide powerful tools & pre-built functions for AI & ML tasks.

2, Easy to Read & Write

Python's clean & readable syntax allows developers to express AI & ML concepts in a straightforward manner. This makes it easier to prototype, experiment, & collaborate on projects.

3, Large Community & Support

Python has a vibrant community of developers who actively contribute to AI & ML projects. This means you can find ample resources, tutorials, & forums to seek help & stay updated with the latest advancements.

4, Integration capabilities:

Python seamlessly integrates with other languages like C & C++, allowing you to combine the efficiency of low-level languages with the simplicity & flexibility of Python.

5, Data Handling & Visualization

Python provides excellent libraries like pandas & matplotlib for data manipulation, analysis & visualization. These tools enable efficient data preprocessing & exploration, essential steps in AI & ML workflows.

5. Discuss the importance of indentation in python code

Indentation plays a crucial role in python code. In python, indentation is used to define the structure & hierarchy of code blocks, such as loops, conditionals, & functions.

$x = 10$

if $x == 10$:

 print('x is equal to 10')

Output: x is equal to 10

1) Readability: Indentation enhances the readability of python code. By visually representing the code's structure, indentation makes it easier for developers to understand flow & logic of the program.

2) code blocks: 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 & teams.

4) Debugging

Indentation errors can lead to syntax errors or logical bugs in python code. By paying attention to proper indentation, you can catch & resolve these errors early, making the debugging process smoother.

6) Define Variable in python. provide ex of valid variable names.

* Variable used to store data values we should not use keywords we should not use special characters

city-name - 'warangal'

Variable Assigning

x = 5

y = "Hey Vec"

z = 3.14

print(z)

print(x)

print(y)

3.14

5

Hey Vec

7) Explain the difference between a Keyword & an Identifier in python

Keywords

Keywords are reserved words with special meaning

Keywords do not have symbols

specify the type/kind of entity

Keywords are not further classified

Identifiers

Identifiers is a unique name given to the class function array etc. etc.

Identifiers can have symbols

Identify the name of a particular entity

Identifiers are classified into 'external name' & 'internal name'

8. List the basic datatypes available in python

Datatypes:

Integer (int):

Represents whole numbers, both positive & negative for ex, 5, -10, 0.

Float:

Represents decimal numbers.

Ex: 3.14, -2.5, 0.0

String (str):

Represents a sequence of characters enclosed in single quotes ("") or double quotes ("")

Ex: "Hello, world!", 'python!', '123!'

Boolean (bool):

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

List

Represents an ordered collection of elements enclosed in square brackets [].

Ex: [1, 2, 3], ['apple', 'banana', 'cherry'].

Q. Describe the syntax for an if statement in python

executes one block of code if a condition is true & another block if it is false.

7 if condition :

- 1) The keyword 'if' is followed by a condition, which is an expression that evaluates to either True or False.
- 2) After the condition, there is a colon(';) to indicate the start of the code block that will be executed if the condition is True.
- 3) The code block is indented & contains one or more statements that will be executed if the condition is True.

Ex: $x = 22$

```
if x > 50  
    print("x is greater than 50")  
else:  
    print("x is not greater than 50")
```

Output: x is not greater than 50

- 10) Explain the purpose of the elif statement in python

The 'elif' statement in python stands for "else if". It is used when you want to check multiple conditions in a sequence.

Syntax

```
if condition1:  
    # code block to be executed if condition1 is True  
    Statement1  
    Statement2
```

elif condition 2:

code block to be executed if condition 1 is
false & condition 2 is True

Statement 3

Statement 4

else

code block to be executed if all conditions
are False

Statement 5

Statement 6

* The 'elif' statement allows you to check additional
conditions after the initial 'if' statement.

* If the first condition is false, it moves on to the
next 'elif' statement & checks its condition.

* If that condition is true, the corresponding code block
is executed.

* This process continues until either a condition is True
or there are no more 'elif' statements. If none of
the conditions are True, the code block within the
'else' statement is executed.

* Using 'elif' allows you to handle multiple scenarios
& perform different actions based on the specific
condition that evaluates to True.