

Assignment

1. Define Artificial Intelligence (AI) and provide examples of its applications
- Artificial Intelligence, the ability of a digital Computer. Controlled robot to perform tasks Community associated with intelligent beings.
- Since the development of the digital Computer in the 1940's it has been demonstrated that Computers tasks, such as discovering proofs for mathematical theorems or playing chess with great proficiency. still despite continuing advances in the Computer processing speed and memory capacity. there as yet no Programs that can match full human flexibility Over domain or tasks requiring much everyday knowledge.

- Automated Customer Support
- Personalized shopping experience
- Health Care
- Finance

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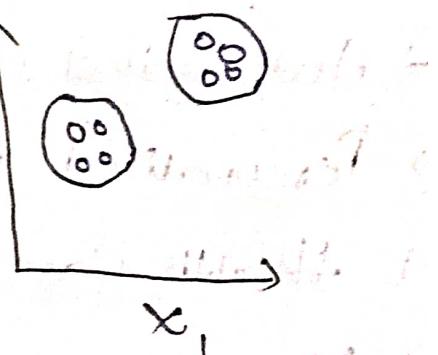
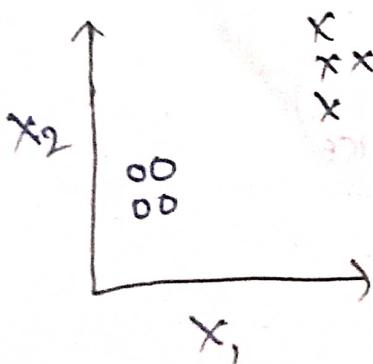
2. Differentiate between Supervised and unsupervised learning techniques in ML.

Supervised learning

- Input data is labelled
- Has a feedback mechanism
- Data is classified based on the training dataset
- Divided into Regression and Classification
- Used for Prediction.
- Algorithms include : decision trees, Logistic regressions, Support Vector machine

Unsupervised learning

- Input data is Unlabelled
- Has no feedback mechanism
- Assigns properties of given data to classify
- Divided into Clustering and Association
- Used for Analysis
- Algorithms include : K-means clustering, hierarchical clustering, apriori algorithm.



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

Python is a high-level, interpreted Programming language known for its simplicity and readability. It was created by Guido Van Rossum and first released in 1991. Python is widely used across the various domains such as the web development, data science, artificial intelligence, science computing, automation and more.

Syntax :-

```
# Code
print("Hello World")
```

features :- Python has plenty of features that makes it most demanding and popular.

- Easy to read and understand
- Interpreted language
- Object-Oriented Programming language.
- Free and Open Source
- Versatile and Extensible
- Multi platform
- Dynamically typed
- Huge and active Community

Advantages:-

- Easy to learn, read and understand
- Versatile and Open Source
- Improves productivity
- Supports libraries
- Large Community
- Huge library

Q. What are the advantages of using Python as a programming language of AI & ML?

- Python is widely regarded as one of the best Programming Languages for AI and ML due to several reasons:
- Ease of learning and use :- Python's Syntax is clear, concise and resembles pseudo-code, making it easy to understand.
 - Vast Ecosystem of libraries:- Python boasts a rich ecosystem of libraries and framework specifically tailored for AI and ML tasks.

Community Support :- Python has a large and active community of developers who contribute to its growth and improvement.

Flexibility :- Python is a versatile language that supports multiple programming paradigms, including Procedural, Object-Oriented, and functional programming.

→ **Interoperability :-** Python seamlessly integrates with other languages and platforms allowing developers to leverage existing codebases and infrastructure.

→ **Scalability :-** While Python is often criticized for its performance compared to lower-level languages like C++ or Java, its performance is usually sufficient for most AI and ML tasks.

5. Discuss the importance of Indentation in Python Code

Indentation in Python is not just a matter of aesthetics, it's a fundamental aspect of language's syntax. Here's why it's so important:

→ Readability and Clarity:- Python emphasizes readability and indentation in Python is not just a matter of aesthetics, it's a fundamental aspect of language's syntax. Here's why it is so important.

→ Enforcement of Code Structure:- Unlike many other programming languages that use braces or keywords to denote code blocks, Python uses indentation.

→ Consistency:- Python's Syntax enforces consistency in code formatting.

→ Debugging and Maintenance:- Properly indented code is easier to debug and maintain.

→ Style Guidelines:- Python has PEP 8, the official style guide for Python code which recommends using 4 spaces for indentation level.

→ Pythonic Code:- Writing Code that adheres to the Pythonic Conventions, including proper Indentations, is often remembered to as writing "Pythonic Code".

Q. Define a Variable in Python. Provide examples of Valid Variable names

In Python, a Variable is a name that refers to a Value stored in the memory. You can see define or assigning a value to it using the equal sign (=). Variable names must adhere to certain rules and conventions.

Rules of Variable names in Python

1. Variable names must be start with a letter (a-z, A-Z) or an underscore

2. the remaining characters in a Variable Name Can be letters, digits (0-9), or underscore.

- 3. Variable names are Case-Sensitive
- 4. Variable names Cannot be reserved words (Keywords) like if, else, etc.

Example

$x = 5$, $X = 5$, $x = 5.5$, $5x = 5$, etc.

`name = 'alice'`, `Name = 'alice'`, `NAME = 'alice'`, etc.

`My-Variable = 10.5`

`totalCount = 10000`.

Q. Explain the difference between a Keyword and Identifier in Python.

A. Python Keywords and Identification are both important elements of the language but they serve different purposes.

1. KEYWORDS:-

Keywords are reserved words that have the special meaning and functionality in Python.

→ These words cannot be used as identifiers because they are already reserved for specific purpose.

Ex:- Keywords in Python include, if, else

2. IDENTIFIERS:-

Identifiers are names given to entities like

Variables, functions, class, modules etc.

→ They are user-defined and can be used to represent the various elements in the Python Program.

→ Identifiers must follow some rules

→ They can consist of letters, digits and underscore

- They must start with a letter
- Identifiers are Case-Sensitive
- they cannot be keywords.

Q. List the basic datatypes available in Python:

1. INTEGER(int):- represents the whole numbers without any decimal point
Ex:- 5-10, 10000
2. FLOAT:- represents the number with a decimal point or numbers in exponential form using 'e' or E ex:- 3.14, -0.0001
3. STRING(str):- represents a sequence of characters enclosed with Single (' "), double (:",") triple ("" "" "") quotes
Ex:- hello
4. BOOLEAN(bool):- represents a boolean value, either or true or false, used in logical Operations and Conditions.
5. LIST(list):- represents an ordered and immutable Collection of items enclosed with Parenthesis []. brackets, separated by commas.

6. TUPLE (tuple):- represents and immutable and Ordered Collection of items enclosed with Parenthesis.

7. DICTIONARY (dict):- represents a collection of Key - value Pairs enclosed with Curly braces {}.

8. SET (set):- Represents an unordered and mutable collection of unique items enclosed with Curly braces {}, Separated by the Commas.

9. Describe the Syntax for an if Statement in Python.

In Python, an if Statement is used for Conditional execution of Code based On the evaluation Of expression

if Condition:

Code block To execute if Condition is true

Statement 1

Statement 2

Q. Explain the Purpose of the "Elif" Statement in Python?

The "elif" Statement in Python starts for else if it allows you to check additional Conditions such that after the initial "if" Statement. the Purpose of "if else" ie to provide the alternate Condition to evaluate if the Preceeding "if Condition" is false; here's why 'elif' is useful

1. MULTIPLE CONDITIONS :-

In Situations where you need to evaluate multiple Conditions Sequentially. 'elif' allows you to specify additional Conditions without nesting multiple "if" statements.

2. EXCLUSIVE CONDITIONS:-

'elif' helps to handle exclusive cases that are not covered by initial 'if' Condition. if initial 'if' Condition is false then it executes the 'elif' Condition.

3. EFFICIENCY:-

Using 'elif' can make your code more efficient

Compared to using nested 'if' statements