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

Artificial intelligence (AI) refers to computer systems capable of performing complex tasks that historically only a human could do, such as reasoning, making decisions, or solving problems.

AI is the science and engineering of making machines that are capable of:

- Reasoning

- Planning

- Learning

- Understanding their environment

Examples:

. Manufacturing robots

. Self-driving cars

. HealthCare management

. Virtual travel booking agent

. Social media monitoring

These are the examples of AI .

Artificial Intelligence and of its applications

They are:

1. Application of Artificial Intelligence in Education

Artificial Intelligence helps create a rich learning experience by generating and providing audio and video summaries and integral lesson plans.

1. Application of Artificial Intelligence in Lifestyle

Artificial Intelligence has a lot of influence on our lifestyle. Let us discuss a few of them.

Autonomous Vehicles

Spam Filters

Facial Recognition

1. Application of Artificial Intelligence in Robotics

It can be used for:

. Carrying goods in hospitals, factories, and warehouses

. Cleaning offices and large equipment

. Inventory management

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

|  |  |
| --- | --- |
| Supervised learning | Unsupervised learning |
| It involves building a model to estimate or predict an output based on one or more inputs. | It involves finding structure and relationships from inputs. There is no “’supervising’’ output. |
| Explanatory and Response variables | Explanatory variables only |
| Types of algorithms   1. Regression 2. Classification | Types of algorithms   1. Clustering 2. Association |
| Learning takes place offline | Learning takes place online |

|  |  |
| --- | --- |
| Used for prediction | Used for analysis |
| Input data is labeled | Input data is unlabeled |
| Less complex | More complex |
| In this supervised known number of classes | In this unsupervised unknown number of classes |
|  |  |
|  |  |

## 3. What is python? Discuss its main features and advantages.

Python is an interpreted language, a high-level language and dynamic language. It is easy and simple to learn.

. Interpreted language: Programming language where the source code is translated into machine code and executed line by line.

Example: python, Ruby, JavaScript

. Compiled language: Programming language where the entire source code is translated into machine code first in the compilation step and then executed is called a compilation language.

Example: C language

Features:

. Easy To Learn and Readable Language.

. interpreted language.

. Dynamic language.

. Open Source and Free.

. High-level language.

. Object Oriented Programming Language.

Python Advantages:

.  Easy to learn

. Availability of support

. Large global community

.  Free learning resources

. Free and open-source

. Productivity and workflow speed

## What are the advantage s of using python as a programming language for AI and ML?

Some advantages of using Python for Machine Learning and AI-based projects include:

. Less Code

. Access to great libraries and frameworks for AI and machine learning (ML)

. Simplicity and consistency

. Platform independence

. Flexibility

AI is on the onset of creating a technologically advanced world, with Netflix and Spottily already leveraging the technology to recommend TV shows/movies and artists/songs to their users. AI is also making its way in industrial processes to enhance process workflows and employee productivity.

#### Advantages of Using Python for AI

Python is an outstanding language majorly because it doesn’t need compiling into machine language instruction to be executed. A developer can directly run a program written in Python.

But other than this, there are a lot more benefits of choosing to develop AI projects using Python.

**1. A huge library ecosystem**

Python offers a vast choice of libraries for AI development, which contain base-level items that save coding time. These libraries also make it easy to access, handle, and transform data.

**2. The flexibility of the language**

Python for AI is an extraordinary language, as it is truly flexible:

. It offers a choice to pick from using Object Oriented Programming (OOPS) or scripting.

. There’s no compelling reason to recompile the source code; developers can actualize any changes and observe the outcomes.

. Software developers can join Python and other languages to achieve their goals.

1. **Huge Number of Libraries and Frameworks**:
   * Python boasts an extensive ecosystem of libraries and frameworks specifically designed for AI and ML development.
   * Libraries like **Sickest-learn**, **spaCy**, and **Natural Language Toolkit (NLTK)** provide pre-built implementations of various ML algorithms.
   * Popular deep learning frameworks such as **TensorFlow**, **PyTorch**, and **Keras** are also widely used in the AI community.
2. **Easy Syntax and Resembles English Language**:
   * Python’s syntax is straightforward and resembles everyday English, making it easy for developers to learn and understand.
   * Unlike languages that rely heavily on brackets, Python uses indentation, which reduces code complexity.
3. **No Need to Recompile Source Code**:
   * Python allows developers to make changes quickly without the need for recompilation.
   * This flexibility accelerates development and experimentation.

## Discuss the importance of indentation in python code.

Python’s approach to using it instead of explicit separators **reduces visual clutter and helps prevent common errors caused by misplaced or mismatched delimiters. Python ensures that developers follow a standard and consistent style while using indentation which makes it easier to understand and modify code written by others and reduces ambiguity**.

num = int(input("enter number"))

if num%2 == 0:

   if num%3 == 0:

      print ("Divisible by 3 and 2")

   else:

      print ("divisible by 2 not divisible by 3")

else:

   if num%3 == 0:

      print ("divisible by 3 not divisible by 2")

   else:

      print  ("not Divisible by 2 not divisible by 3")

### Define a variable in python. Provide examples of valid variable names.

Variables: It is used to stores the data values

. We should not use keywords.

. We should not use special characters.

Ex; City-name = ’Warangal’

**Variable** **Assigning**: It is used to store multiple data.

X = 5

Y = ‘Hello’

Z = 3.14

Print (z)

Output : 3.14

**Multi** **Variable Assigning**: Multiple variables are int var, float var, string var = 3,4,5

Print ( float var)

4. 5

**Operators:**

1. Arithmetic Operator:

5+6=11

1. Comparison Operator:

10>5

True

1. Logical Operator:

AND, NOR, NOT

**Data Types:**

Which represents the data types storing in the

1. **Numeric data types:**

Var 1 = 18

Var 2 = 10.5

Var 3 = 10+2j

Print (type (var 1))

Print (type (var2))

Print (type (var3))

Run:

(Class ‘int’)

(Class ‘float’)

(Class ‘complex’)

1. **String:**

Group of characters and are stored in with in double cots (“ “).

Str(“Hello World”)

Run:

Hello World

### Explain the difference between a keyword and an identifier in python.

|  |  |
| --- | --- |
| Keyword | Identifier |
| Keywords are reserved words with special meaning. | Identifier is a unique name given to the class, function, array & so on. |
| Keywords do not have symbols. | Identifier can have symbols. |
| Specify the type/kind of entity | Identify the name of a particular entity |
| Keywords are not further classified | Identifiers are classified into ‘external name’  And’ internal name’ |
| Example:  Class, While | Example:  Var, a, \_newstr, new var, and so on |

### 8. List the basic data types available in python.

Th[e basic data types available in Python are](https://www.bing.com/ck/a?!&&p=c534ec4e29686a85JmltdHM9MTcxNDM0ODgwMCZpZ3VpZD0yNmEyZGVjNS01OGZlLTY1OTItM2VlMy1jZDJlNTk1MzY0MmMmaW5zaWQ9NTg3NQ&ptn=3&ver=2&hsh=3&fclid=26a2dec5-58fe-6592-3ee3-cd2e5953642c&psq=List+the+basic+data+types+available+in+python.&u=a1aHR0cHM6Ly93d3cuYW5hbHl0aWNzdmlkaHlhLmNvbS9ibG9nLzIwMjEvMDgvZGF0YS10eXBlcy1pbi1weXRob24teW91LW5lZWQtdG8ta25vdy1hdC10aGUtYmVnaW5uaW5nLW9mLXlvdXItZGF0YS1zY2llbmNlLWpvdXJuZXkv&ntb=1)

. Numeric: int, float, complex

. String: Str

. Sequence types: list, tuple, range

. Binary types: bytes, bytearray, memoryview

. Mapping data type: dict

Each data type has its own set of properties, methods, and behaviors that allow programmers to manipulate and process data effectively in their programs.

### Describe the syntax for an if statement in python.

An if statement executes a block of code only if the specified condition is met. Syntax Here, if the condition of the if statement is:

1.**True - the body of the if statement executes.**

2.**False - the body of the if statement is skipped from execution.**

If statement:

a = 33  
b = 200  
if b > a:  
  print("b is greater than a")

### Syntax of If Statement:

Following is the syntax of if-statement in Python.

if boolean\_expression:

statement(s)

## 10. Explain the purpose of the elif statement in python.

The **purpose of the `elif` statement in Python** is to:

1. [Handle multiple conditions sequentially](https://www.bing.com/ck/a?!&&p=018734e0f1191586JmltdHM9MTcxNDM0ODgwMCZpZ3VpZD0yNmEyZGVjNS01OGZlLTY1OTItM2VlMy1jZDJlNTk1MzY0MmMmaW5zaWQ9NTg4OA&ptn=3&ver=2&hsh=3&fclid=26a2dec5-58fe-6592-3ee3-cd2e5953642c&psq=Explain+the+purpose+of+the+elif+statement+in+python.&u=a1aHR0cHM6Ly9pb2Zsb29kLmNvbS9ibG9nL2VsaWYtcHl0aG9uLw&ntb=1).
2. [Execute a specific block of code as soon as a true condition is found](https://www.bing.com/ck/a?!&&p=eb43b44b2d17dfdeJmltdHM9MTcxNDM0ODgwMCZpZ3VpZD0yNmEyZGVjNS01OGZlLTY1OTItM2VlMy1jZDJlNTk1MzY0MmMmaW5zaWQ9NTg5Mg&ptn=3&ver=2&hsh=3&fclid=26a2dec5-58fe-6592-3ee3-cd2e5953642c&psq=Explain+the+purpose+of+the+elif+statement+in+python.&u=a1aHR0cHM6Ly9pb2Zsb29kLmNvbS9ibG9nL2VsaWYtcHl0aG9uLw&ntb=1).
3. Serve as a shortened version of ‘’elif”.

Use the elif condition is used to include multiple conditional expressions after the if condition or between the if and else conditions.

Syntax:

if [boolean expression]:

[statements]

elif [boolean expresion]:

[statements]

elif [boolean expresion]:

[statements]

else:

[statements]

The elif block is executed if the specified condition evaluates to True.